

THE *W. Hooper*
ELEMENTS
OF
UNIVERSAL ERUDITION,
CONTAINING AN
ANALYTICAL ABRIDGMENT
OF THE
SCIENCES, POLITE ARTS,
AND
BELLES LETTRES,

BY BARON BIELFELD,

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LOR OF ALL THE UNIVERSITIES OF THE DOMI-
NIONS OF HIS PRUSSIAN MAJESTY, AUTHOR
OF THE POLITICAL INSTITUTES, &c.

Indocti discant, & ament meminisse periti.

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B O O K

BOOK THE FIRST.

C H A P. XLIX.

OF MATHEMATICS.

MATHEMATICS is a science that is employed in measuring of quantities, and in finding their dimensions and proportions. It relates, therefore, to all objects whose quantities can be determined by certain principles, and is, consequently, of vast extent: properly speaking, it has as many subjects as there are in nature different kinds of sensible quantities, or such as can be separated into the parts of which they consist. So there is a quantity in figure, motion, time, heat, cold, &c. and the dimensions of all these different quantities form so many different branches of mathematical science. *Quantity* is nothing more than the degree of dimension, or number of parts of which any thing is composed. A quantity, whose several parts are precisely distinguishable, is called a *number*. Now, as every quantity whatever includes a dimension or a number, there is a general science of quantity, which is called *universal mathematics*, (*mathesis universalis*), and which regards quantity only as it makes a number; and it consists of two parts: the first considers quantity by determinate numbers, and is called *arithmetic*; and the second considers it by indeterminate numbers, and is called *analysis*, or *algebra*.

II. Mathematics is also divided into *simple*, *mixed*, and *abstract*; or into *speculative* and *practical*; or *pure* and *compound mathematics*, &c. Arithmetic and geometry make what is commonly called *simple* or *pure mathematics*: astronomy, optics, &c. belong to

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mixed mathematics: the integral and rational calculus, specious algebra, &c. compose the abstract part of mathematics. All authors, however, do not range the same sciences under the denomination of mathematics. In the year 1670, M. Caramuel, bishop of Campania, published a very ample treatise of all the parts of the mathematics, in two folio volumes, and which he entitled, *Mathesis biceps*, ancient and modern. He there gives forty different treatises of as many sciences; which are, 1. Arithmetic; 2. Algebra; 3. General geometry; 4. Cosmography; 5. Geography; 6. Centroscopy; 7. Orometry; 8. Geodæsia; 9. Hyftiodromy; 10. Hypotalatics; 11. Nestics, or the art of swimming; 12. Nautics, sublunary and celestial; 13. Potamography; 14. Hydraulics; 15. Aerography; 16. Anemometry; 17. Seiography; 18. Logarithms; 19. The art of play, which he calls *Kibeie*; 20. Arithmomancy; 21. Trigonometry; 22. Astronomical trigonometry; 23. The science of the ordinary compals, and of that of proportion; 24. Military Architecture; 25. Music; 26. Metallics; 27. Pedarics; 28. Statics; 29. Hydrostatics; 30. Meteorology; 31. Spherics; 32. Oscillatory, or the science of lenses; 33. Rectilinear oscillatory; 34. Optics; 35. Catoptrics; 36. Dioptrics; 37. Perspective; 38. Navigation; 39. Pyrometry; 40. Pyrorechny.

III. We here quote all these terms merely to show how far the bounds of the mathematics may be extended, when a pedantic humour of multiplying the names of sciences prevails: and I observe, that this humour is daily increasing, and that not only in mathematical but other sciences, which spring from the brains of modern authors. So we see an *bepheftics*, or art of invention; a *methodology*, or art of arranging; a *mnemonics*, or art of memory; an *ars apodemica*, or art of travelling, &c. It is ridiculous enough for mankind to endeavour to reduce that into a separate art or science, which depends altogether on the faculties of the mind or body; or which already makes part of another science, and by that means

means to multiply the parts of erudition without the least necessity, and thereby render it more complex and difficult. It would be altogether as easy to write a treatise on *Somniscaptury*, or the art of sleeping, by which mankind might be taught the method of arranging their pillows, bolsters, and matrasses, and of choosing the most favourable hour, &c. for the cultivation of sleep.

IV. Let us rather, in this labyrinth of the mathematics, pursue that course which has been pointed out to us by the justly illustrious Wolff, in his *elements of all the mathematical sciences*. This book, the most useful we know of the kind, is translated into almost all languages, and is every where to be met with. As our design is not to enter into a deep discussion of the sciences, but merely to point them out, and give a just idea of them, we shall extract only so much of this book, as will serve to form a clear and succinct analysis; still, however, adding such remarks, as we think may tend to elucidate these subjects; for perspicuity is what we principally aim at in this work, though we may assign but a paragraph or two to some particular sciences.

V. (1) ARITHMETIC is a science that teaches the value and properties of numbers, and the method of employing them in calculations, with certainty and facility. It has properly five fundamental parts, which are called rules, and which are *Numeration*, *Addition*, *Subtraction*, *Multiplication*, and *Division*. When several units of the same kind are combined together, they form a *number*; and thus Euclid describes a number to be a multitude of units. By adding to one ball another ball, they become two; and by still adding another, they become three, &c. To *compute*, or numerate, therefore, signifies to find how many units of the same kind and value are contained in any given number. By *Addition* we find one number that is equal to several other given numbers, and the number thus found is called their *sum*. By *Subtraction* we deduct a determinate number, or combination of units, from a greater determinate number,

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in order to find one that is equal to the true difference between those numbers, and which is called the *remainder*. *Multiplication* teaches us, by means of two numbers given, to find a third, which shall contain one of the other numbers as many times as that number contains units. By *Division* we find a number, which shows how many times one given number is contained in another given number; or, in other words, we divide a given number into equal parts, by another given number, and find how often the one is contained in the other. These four last rules form the basis of all calculation; but there results from them an infinity of others, for the diverse subjects to which calculation is applied; as the rule of proportion, or the rule of three; the rule of fractions for finding the parts of a unit; the rules for numbers compounded of different sorts of units; the rules that relate to exchange; the prices of merchandise; the value of gold, silver, and other metals; the rules of interest and discount, and those of partnership; those that relate to time, which are called *reductio terminorum*; such as are used in the extraction of roots; and numberless others, which all appertain to, and are to be learned by the study of arithmetic itself.

VI. (2) GEOMETRY is a science that is employed in considering the figures of bodies; that is, their length, breadth, and thickness. When we consider length, without breadth or thickness, we call it a *line*; and the beginning or end of that line we call a *point*; but we must conceive of this point as having no parts, for otherwise it would be a line, and have beginning and end. When a point moves from one place to another, it describes a line. A right line is that of which the whole and all its parts are similar; a curve line, on the contrary, is that whose whole is not similar to its parts: by similarity we mean a conformity in those qualities, by which the mind distinguishes objects. Of all curve lines the circle is the most known, and the most useful. A *circle* is described by the motion of a right line about a fixed point; this point is called the *centre*, because all the
points

points of the periphery, or circumference, are equally distant from it. A line, that goes from the circumference to the centre, is called a *semidiameter*, or *radius*. A line drawn from any part of the circumference, and passing through the centre to the opposite side, is called a *diameter*; and every line that is drawn from one part of the periphery to the other, and that does not pass through the centre, is called a *chord* or *subtense*. When two lines join each other in one point only, their inclination toward each other, or the distance between them, is called an *angle*. When on a line that is parallel to the horizon another line is placed upright, so that the angles on each side are equal, it is called a *perpendicular*. Every angle, that a line truly perpendicular forms with a line truly horizontal, is called a *right angle*. An angle, where the two lines approach nearer to each other, is called an *acute angle*: and every angle where the lines are more distant from each other, than in a right angle, is called an *obtuse angle*. When an angle is terminated by a third right line, it is called a *triangle*, which is either *equiangular*, or *acute*, or *obtuse*, according to the figure of its angles. A *parallelogram* is a right lined quadrilateral figure, whose opposite sides are parallel. A *square* is a parallelogram that has four equal sides, and four right angles. A *Rectangle* is a parallelogram that has four right angles, but whose opposite sides only are equal. A *Rhomb* is a parallelogram that has four equal sides, but two of its opposite angles are acute, and the other two obtuse. A *rhomboid* is a parallelogram whose opposite sides only are equal, and two of its opposite angles acute, and the other two obtuse. Every right lined quadrilateral figure, whose opposite sides are not parallel, is called a *trapezium*.

VII. All figures, that have more than four sides are called *polygons*; and such are the pentagon, hexagon, octagon, &c. When the sides and angles of a figure are equal, it is said to be *regular*; and when they are unequal, it is called an *irregular figure*. When two lines preserve every where an equal distance

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stance between themselves, they are said to be *parallel*. When a semicircle turns about its diameter, it describes a globe; so that all the points of its circumference are equally distant from the centre. When a rectilinear figure descends in a right line, so that it always remains parallel to itself, that is, that each of its sides describe a parallelogram, it forms a *prism*; and when a circle descends in like manner, it describes a *cylinder*. Prisms are square, triangular, &c. and in prisms, as well as cylinders, all sections, that are parallel to the base, are equal among themselves. When a parallelogram descends, in a perpendicular line, on an horizontal plane, it describes a *parallelepiped*. When a square descends in like manner through a space equal to one of its sides, it describes a *cube*. When a triangle moves round one of its sides, it describes a *cone*: and the same solid is generated, when one end of a line being fixed, the other moves round the periphery of a circle. All the sections of a cone, that are parallel to its base, are circles; and they decrease in proportion, as they approach the apex of the cone. When one end of a line remains fixed, and the other passes through the periphery of a rectilinear figure, it describes a *pyramid*. When the surface of a body is composed of regular and equal figures, and its solid angles are all equal, it is called a *regular solid*; and when they are not equal, it is called an *irregular solid*.

VIII. These simple definitions are the basis of all the operations of geometry; and from these it draws certain and evident consequences for the establishment of axioms and principles. From these principles it passes to fundamental rules; from these fundamental rules, it forms rules of practice; and from the rules of practice it proceeds to application. The principles, here laid down, are so clear and simple, that it is almost impossible they should fail of conviction; and the figures and demonstrations, made use of in this science, are evident and indubitable. Geometry in general is divided into four parts, which are *planimetry*, that teaches the knowledge of lines and surfaces;

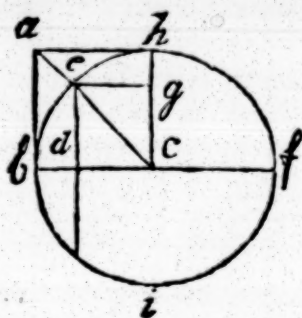
faces ; and is united to *geodæsia*, by which the surfaces of all sorts of planes are measured : *altimetry*, which measures altitudes and depths, in every direction, as a mountain, or tower, &c. *longimetry*, by which distances are measured, whether they be accessible as a road, or inaccessible, as an arm of the sea : and *stereometry*, which teaches to measure solid bodies, as globes, cylinders, the body of a ship, &c. and to know how much they contain or weigh. Geometry is likewise divided into theoretic and practice. The former demonstrates the truth of those propositions which are called *theorems* ; and the second teaches the manner of applying them to some particular purpose, by the resolution of *problems*. The rest of this science, as the knowledge of the instruments of which it makes use, especially in practical geometry, in mensuration, and all other uses that are relative to that art, are all to be learned by the study of the science itself.

IX. (3) TRIGONOMETRY is a science that teaches to find, by having some three parts of a triangle given, the three other parts : to wit, 1. by two sides and an angle given, the remaining side and the other two angles ; 2. by two angles and a side given, the two other sides and the third angle ; 3. by the three sides given, the three angles. Trigonometry may at first sight appear trifling, or at least of so little consequence as not to deserve the name of a particular science : but it is proper here to inform the reader, that it is to this science, that mankind are indebted for the most sublime discoveries ; and that it is of the utmost importance in astronomy, navigation, &c. Without the aid of this science, we should have been still ignorant of the dimensions of the planets, their distance from the earth, their motions, their eclipses, even the knowledge of the figure of this globe we inhabit, and of numberless other matters equally curious and useful. We must, therefore, regard trigonometry as an art that unfolds some of the greatest secrets in the system of the universe ; and therefore no mathematician ought to be ignorant of it. Trigonometry

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metry is divided into plane and spherical; each of which considers only the angles and sides of the triangle, without regarding its surface.

X. The half of the chord or subtense of an arch, as ed in the circle $b e b f$, is called the *sine* of that arch. The sine of an arch, therefore, descends perpendicularly on the radius of the circle; and the sines of several arches are all parallel among themselves.



Draw a perpendicular to the end b of the radius bc ; this line ab is called the *tangent* of the arch and also of the angle, and the diagonal line ac is the *secant* of the same arch and the same angle: the line bd , intercepted between the right line and the tangent, is called the *versed*

sine; and the line eg , which is the sine of the complement of that arch to a quadrant, is called the *co-sine*; the lines ab and ac are in like manner called *co-tangent* and *co-secant*: lastly, the radius bc is called the *whole-sine*, because all the others are taken out of it; and as it is the sine of the whole quadrant, it naturally becomes the sine of a right angle. If over a line of figures, in arithmetic progression, be wrote another line in geometric progression, the lower line of numbers is called the logarithms of the respective numbers that are over them, as

1.	2.	4.	8.	16.	32.	64.	128.	256.	512.
0.	1.	2.	3.	4.	5.	6.	7.	8.	9.

logarithms.

So that 0 is the logarithm of 1, 1 the logarithm of 2, 2 the logarithm of 4, 7 the logarithm of 128, &c.

XI. These few definitions include almost all the terms that are used in trigonometry; and this science draws, as well as geometry, principles, fundamental rules, and rules of practice, for determining every kind of distance, angle, altitude, &c. and lends its aid to geometry, navigation, and astronomy. Sometimes

times it takes a height that is inaccessible ; sometimes the elevation of a building, whose summit we can view from two windows only ; sometimes the distance between two places that are accessible, and at others a distance where only one part is accessible, as the breadth of a river ; sometimes the distance between two places, both of which are inaccessible ; and sometimes it is employed in measuring the dimensions of an arch. Now it ascends to heaven, and measures the distance and magnitude of the celestial bodies ; and then descends into the earth, and fathoms the depth of caverns. At another time it is employed in searching the precise proportion of the diameter of a circle to its circumference, and which is called *squaring the circle*. The problem of squaring the circle has been so much celebrated, that we cannot avoid giving a brief explanation of it in this place. By the square of any figure, is meant the space that is contained within its circumference ; or a geometric reduction of a figure of any form into a square of equal content. Those figures, whose circumference are right lines, are easily squared ; but those of curved lines are more complicate. Of all curve figures, the circle was the first known to the ancients. When they would find the content of a circle, they easily perceived, that they had nothing to do but multiply the circumference by a fourth part of the diameter ; it was therefore only necessary to find the circumference : to do this, they could surround it with a thread or other flexible matter, and then measure its length ; or they could roll it on a pline, and measure how much of the plane was equal to the circumference of the circle. But trigonometry is not to be satisfied with these mechanical means. It must, by the nature of a circle, deduce *a priori* from the length of the diameter that of the circumference ; and this is what is called squaring the circle : a problem that has in all ages engaged the attention of the most famous mathematicians. In the ordinary affairs of life, three times the length of the diameter, makes the periphery of a circle. So, when you want

a girdle to your hat, the maker gives you one of thrice its diameter. But this is by no means a true mathematical proportion: that of 7 to 22 comes nearer; and that of 100 to 314 still nearer, &c. There have been made thousands of calculations of this problem, each still approaching nearer to the truth; but the exact proportion yet remains to be determined, and will so remain to the end of time. This, however, is no great misfortune to mankind, for this inquiry, after the precise square of the circle, is a matter of mere speculation and curiosity, and from which the least utility cannot be derived: for Newton, who has changed the face of geometry, and instead of the tedious operations of the ancients who inscribed a polygon in a circle, and continually increased the number of the sides of that polygon, by which they made, each time, a greater degree of approximation, found, by one operation only, the true numbers that expressed the content of the area of a circle: but these are not finite numbers, but an infinite series of decreasing terms, the sum of which gives the area to so much greater degree of exactitude, as we take a greater number of its terms. He has shewn how to diminish these terms so far, that it is only necessary to add a small number of them, to approach extremely near the truth: for it is the minute numbers, toward the close of the infinite series, that prevent their coming at the exact square. He has carried the approximation so far, that, in a number of an hundred figures, which is to express the circumference of a circle, whose diameter is given, it does not err one unit; and this same calculation may be extended *ad libitum*: so that, in a circle equal to that which the earth describes about the sun, the calculation will not fall short the breadth of a hair: and if this error is thought too great, it may be diminished to as many thousand times less as you please; a precision so great, as to be far beyond all possible use, and as to render all further inquiry concerning this matter utterly insignificant.

XII. It is thus that plane trigonometry is employed in finding, by the means of some three given parts of a triangle, the three other unknown parts. In like manner (4) SPHERICAL TRIGONOMETRY is the science of finding, by means of any three given parts of a *spherical triangle*, the other three remaining parts. A spherical triangle is a space included by three arches of a great circle. The great circles of a sphere are those that have the same centre and diameter with the sphere; and they divide it into two parts of equal magnitude. The angle, by which two circles divide a sphere, is called a *spherical angle*. That point, from which all the points of circumference of a circle on the surface of a sphere are equally distant, is called the *pole* of that circle; and the circle, which passes through the two poles of a sphere, is one of its great circles. The right line, which goes from one pole to the other and passes through the centre of a sphere, is called the diameter of that sphere. The longest side of a right angled triangle, or that which subtends the right angle, is called the hypotenuse. In every right angled triangle, the square of the hypotenuse is equal to the square of the other two sides. It is by these simple principles, that spherical trigonometry is enabled to measure all circular heights and distances, and to explain all the orbicular movements. This part of trigonometry is, in a particular manner, applicable to astronomy; and is used in determining the motions of the celestial bodies, their rising and setting, their true place in the heavens, their elevation above the horizon, and numberless other like matters.

XIII. (5) ALGEBRA is a science that teaches to find, by having certain finite quantities given, and by the aid of equations, other finite quantities, that have certain relations to those that are given; or, in other words, it is a kind of universal arithmetic, by means of which may be resolved all mathematical problems that are resolvable. Some celebrated authors have named it *the analytic art*, or *the art of equation*; others call it *cos*, or *regula rei & census*; others the

art of *comparison* and *restitution*; and others again, the rule of *restoration* and *opposition*. The word algebra, which comes from the Arabic, is composed of the particle *al* and the noun *gebr*, and properly signifies reduction. There are two sorts of algebra, which are called the *vulgar* and the *specious*. The vulgar, or numeratory, is that of the ancients, who made use of numbers in their solutions of arithmetic problems, without any demonstration. The specious or new algebra, instead of numbers, employs the letters of the alphabet, to express the quantities, the kinds or forms of matters on which its inquiries are exercised, by which the imagination of those who apply themselves to this science is greatly assisted; for without this we must continually keep in mind those matters, concerning which we are making inquiries, and that could not be done, without a prodigious effort of the memory. Specious algebra, moreover, is not like the numeral, limited to a particular kind of problems; and is not less adapted to the inventing of all sorts of theorems, than it is to the solution and demonstration of problems.

XIV. By *quantity* in the mathematics, is meant every object that is capable of being augmented or diminished. The essence, therefore, of every quantity whatever, consists in the proportion which it bears to another quantity of the same nature; and consequently quantities are indeterminate numbers, seeing that we do not conceive of any absolute unity. All objects in nature have their limits, and may be compared with other objects of the same kind; and consequently we ought to consider them as susceptible of augmentation and diminution, that is to say, as quantities; and it is for this reason that algebra, or calculation by characters, is extended to all finite objects, and furnishes distinct ideas of their limits. Quantities being indeterminate with regard to number, they cannot be changed but by the means of numbers, either by adding, subtracting, multiplying, or dividing. The letters or characters of which algebra makes use in its operations, are in fact arbitrary; custom

custom however has established the use of the first letters of the alphabet, *a, b, c, d,* &c. for the known quantities, and the last letters *x, y, z,* for those that are sought. The principal notes or signs in algebra are; that which is called *plus*, or *more*, and is thus marked $+$ and is the sign of addition; so $7 + 3$ signifies 7 more 3, or that 7 is to be added to 3. That which is called *minus* or *less*, which is thus marked $-$ and is the sign of subtraction, so $7 - 3$ signifies 7 less 3, or that 3 is to be subtracted from 7. When two quantities are to be multiplied into each other, this character $\times$ is commonly placed between them, thus $a \times b$ signifies that *a* is to be multiplied by *b*, and their product is expressed by the two letters placed closed together, as ab . The sign of division is two points, as $:$ so $a : b$ signifies that *a* is to be divided by *b*; or more commonly the letters are placed like a

fraction thus $\frac{a}{b}$ The sign of equality is this $=$; so

$9 + 3 = 14 - 2$. that is 9 more 3 equal to 14 less 2. When four points thus $::$ are placed between two preceding and two following terms that have two points between them thus, $6 : 2 :: 12 : 4$. it signifies that those four terms are in geometric proportion, that is to say, as 6 is to 2, so is 12 to 4. $\div$ is the note of continued proportion; so 3, 9, 27 $\div$ signifies that 3 is contained as often in 9 as 9 in 27. Two points placed in the middle of four numbers thus, 7, 3 : 13, 9. signifies that they are in arithmetic proportion, that is, that the difference between 7, and 3, is the same as between 13 and 9. Others mark the same by three points $\therefore$. A continued arithmetic proportion is marked thus $\div$, so 3, 7, 11, $\div$ signifies that those numbers are in arithmetic progression. This mark $\sqrt{}$ denotes the root of any number, so $\sqrt{4}$ signifies the root of 4, that is 2, which multiplied by itself produces 4.

When a quantity is multiplied into itself, the product is called the second *power* or *square* of that quantity; and when that second power is multiplied by

by the first, it is called the third power or *cube*; and when that is multiplied by the first, it is called the fourth power; and the fourth again multiplied by the first, is called the fifth power, and so of the rest. The first quantity or power is also called the *root*, with regard to the second, third, or fourth power, &c. Now, as by the multiplication of letters is expressed the multiplication of dimensions, and as the number of letters might be so large as to render it inconvenient to count them, they write the root only, and add on the right hand of it, the *index* of the power, that is, the number of letters of which that power is composed, so in the series a, a^2, a^3, a^4 , or x, x^2, x^3, x^4 , the two last terms imply, that a or x have been multiplied into themselves four times.

XV. It would require a regular treatise on this science, to shew in what manner algebraical calculations are performed according to these principles, and by employing the characters that we have here explained; which would far exceed the bounds we have prescribed to ourselves, and the end we propose, which is only to give a general idea of the sciences, and not to treat them in a systematic form. We shall content ourselves therefore with remarking, that the human mind can form an abstract idea of a general quantity, without applying that quantity to any fixed and determinate object. Now the business of algebra consists in calculating those indeterminate quantities, by applying to them those letters and characters we have just mentioned; and when it has found what it sought, it realizes, so to say, these imaginary quantities, and determines their value, by applying the idea of a real existing quantity to the characters, letters, and numbers, which are the result of an abstract and indeterminate calculation. The letters, therefore, of which it makes use, express each one of them, either lines or numbers, according as the problem is geometric or arithmetic; and when united, represent superficies, solids, or powers, greater or less, according to the number of letters. For example; if there be two letters as a, b , they

they represent a rectangle, the two lines of which are expressed, the one by a , and the other by b ; so that by their multiplication they produce the superficies $a b$. But when there are two similar letters as $a a$, they then denote a square. If there be three letters, as $a b c$, they denote a solid, whose three dimensions are expressed by the three letters $a b c$; the length by a , the breadth by b , and the depth by c ; and by their mutual multiplication they produce the solid $a b c$. This is all that we can say in a few words of so complicate a science: the rest must be learned by a direct application to the study of algebra itself.

XVI. It remains, however, to say something of, (6) the ARITHMETIC OF INFINITES, to show its origin, and to explain wherein it consists. We have said in the 14th section, that the operations of algebra are extended to all finite objects; but what would the ancients have said if they had been told that the time would come when infinity itself should be made the subject of calculation? However, not to make an abuse of words, or possess our readers with false ideas, it is necessary to explain what is here meant by the term infinite, and in what sense it is said to be subject to calculation. We must observe therefore, that *an infinitely small quantity* is only to be considered as *nothing* when compared with another quantity, but not when considered in itself. Suppose, for example, we were measuring the height of a mountain, and that during the operation, the wind should carry from off its top a grain of sand, the mountain would therefore be diminished in its height by the diameter of that grain of sand. But as its altitude is such, that it would, to all human discernment, be still the same, whether the grain of sand remained or were taken away, it may be justly considered as *nothing* when compared to the height of the mountain, or in other words, as *an infinitely small quantity*. This is a truth that no one will dispute who understands the application of geometry to the real objects of nature. In like manner in astronomy, the diameter of the whole

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whole earth, when compared with its distance from the sun, may be considered as a point or infinitely small quantity; and still more justly so, when compared to the distance of the fixed stars, for their apparent motion would be the same, if the earth were in reality an indivisible point. So again, in an eclipse of the moon, the surface of the earth is considered as perfectly free from inequality, for its mountains are regarded as nothing, or as particles infinitely small, when compared to the diameter of the earth, seeing that the shadow of our globe appears precisely the same on the moon as if it were perfectly round. Now, as a very great advantage results to geometry by dividing (in idea) quantities into infinitely small parts, that is, into parts so small that they may be considered as nothing when compared with those quantities, because by this mean we can frequently determine the dimensions of finite quantities, and discover, by an easy method, their hidden properties, it is not to be wondered that geometers should embrace this method when it was once discovered.

XVII. In 1635 a monk, named Cavaliere, published the doctrine of indivisibles; and by that mean prepared the way for what soon after appeared. In this geometry, surfaces are supposed to consist of an infinity of lines, and solids of an infinity of surfaces. It is true, he did not dare to pronounce the word infinite in mathematics, any more than Descartes did in physics: they both of them made use of the moderated term *indefinite*; and they were both to blame; for the terms we make use of should be at all times precisely determinate of what we would express, and not such as are obscure or unmeaning. If any one should ask me, if the number of pieces I had in my pocket were equal or unequal; and I should answer, that it was neither equal nor unequal, but incommensurable, I should express myself in a manner that was at once obscure and absurd. Gregory of St. Vincent, a jesuit of Bruges, continued however the same pursuit with gigantic strides, though by a different course: he reduced infinities to certain finite proportions,

portions, and understood the nature of infinite quantities, both great and small; but his discoveries were drowned in three folio volumes. Wallis, an Englishman, in 1655, boldly published the arithmetic of infinites and numerical infinite series. Lord Brouncker made use of this series in squaring an hyperbola. Mercator, of Holstein, had a large share in this invention; and essayed to apply it to all other curves, in the same manner as lord Brouncker had so happily done. A general method was then sought after, of applying algebra to infinite, in the same manner that Descartes and others had applied it to finite quantities. It is this method that baron Leibnitz and Sir Isaac Newton discovered almost at the same time, and which they each of them mutually claimed; for though the signs and the terms which these two great men made use of are different, yet their meaning is precisely the same. Leibnitz, for example, calls infinites *incomparables*: and Newton names his calculations the *method of fluents*, or *fluxions*: and so of the rest.

XVIII. An infinitely small quantity, therefore, is one that is so small as to bear no proportion to one that is larger, and consequently cannot be compared to it in any sensible manner: or it is a quantity that is smaller than any one that can possibly be assigned. The arithmetic of infinites has three parts; which are, the *calculus differentialis*, the *calculus integralis*, and the *calculus exponentialis* *. The *calculus differentialis* is the method of finding, by having a given quantity, one infinitely small, which taken an infinite number of times shall equal the given quantity. When a quantity infinitely small is considered as the difference between two such quantities, it is called the *differential quantity*. The method of finding the
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* By the calculus differentialis, foreigners mean what we call the direct method of fluxions, or that of finding the fluxion from the flowing quantity given; and by the calculus integralis, the inverse method of fluxions, or that of finding the flowing quantity from the fluxion given. The calculus exponentialis is the method of treating what we name exponential quantities.

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differential quantity between two finite quantities, is called the *differential method*. The *calculus integralis* is the method of finding, by an infinitely small quantity given, the finite quantity from whence it arises, when that finite quantity is treated according to the differential method. To aggregate, or sum up, is to find that quantity from which, by means of the differential calculus, arises that infinitely small quantity which is given. The *calculus exponentialis* consists in differencing, and in summing up quantities that have a variable exponent, as x^x or a^x , and these are called *exponential quantities*. There is also what is called an exponential line, which is a curve that is resolved by an exponential equation, as $x^x = y$.

XIX. Arithmetic, geometry, trigonometry, algebra, and the arithmetic of infinites, are the sciences that may be called the instruments which mathematics makes use of in the operations which it exercises on the whole frame of nature; and these operations form as many different sciences as it is applied to different objects. The whole body of philosophy, for instance, may be comprehended under the title of mathematics; or the whole of mathematics under that of philosophy, and may be called philosophical calculation. We shall explain this matter by a few examples.

XX. The velocity with which any body moves, is in proportion of the space to the time; for example, let the space be $= r$, the time $= t$, the velocity $= c$, it follows, that the velocity is $c = r : t$ and $r = tc$.

The matter of any body is that which constitutes its weight, and moves with it. The momentum, or quantity of motion in any body, is in proportion to its quantity of matter multiplied into its velocity. We determine, therefore, by means of algebra, all the laws of motion that relate to gravitation, or the fall of bodies, and their repulsion, collision and reaction. By the same principles algebra calculates also the refraction of light, according to its different angles of incidence, or as it passes through bodies more or less opaque. We shall proceed to the description of those other arts and sciences that require the aid of calcu-

calculation, and for that reason are comprised under the general title of mathematics.

XXI. (7). ARTILLERY, which is also called *pyrobology*, or *pyrotechny*, is the science that teaches the use and management of fire in all sorts of military operations; as also the knowledge of arms, machines, and instruments of war that are employed in battles and sieges. Since the invention of gunpowder, that has been the principal object in artillery; and as all fire-arms are charged with it, they begin by inquiring after the best method of composing it. Now, gunpowder being made of saltpetre, sulphur, and coal-dust, they endeavour to discover the best method of purifying each of these ingredients, and of properly pulverising and mixing them; and they then show the different manners of essaying its force, &c. This science is likewise extended to the examination of all other combustible matters, by which buildings, or ships of war, &c. may be set on fire: and on this occasion it inquires into the nature of that famous wildfire, which, in the time of the latter emperors, was regarded at Constantinople as one of the secrets of the state. It likewise inquires into the construction of arms, and especially that of cast cannon, which are either of iron, or metal compounded of copper, pewter and brass, which is much more expensive, and also far preferable to iron. They likewise distinguish this part of artillery into cannon, culverin, mortar, &c.

XXII. The diameter of the mouth of a cannon, mortar, &c. is called its *caliber*; as is the diameter of the ball with which such piece is charged. The *vent* is the difference between the diameter of the ball and that of the mouth of the piece, which is only a small part of an inch that is left for the ball to play. The *scale of calibers*, which is also called the *sphereometric rule*, is an instrument on which the dimensions of the diameters of balls and their weights are marked. The mathematical part of gunnery gives the rules for constructing such a scale, and for calculating, for example, what ought to be the diameter
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of a ball of one, two, or three pounds, &c. Each cannon, or other piece of ordnance, is divided into three parts; which are, 1. The *breech*; 2. The *trunnions*; and 3. The *muzzle*, or mouth. The inside of a piece is called its *chase*; and the small round hole by which it is fired, the *touch-hole*: the handles that serve to raise it are called *maniglions*, or *dolphins*. The *carriage*, or *stock*, is that part on which it rests. A piece of ordnance should be thicker at the breech than at the trunnions; and thicker there than at the muzzle. Gunnery gives rules for constructing a cannon or mortar of any given caliber, together with its carriage and wheels, and the manner of drawing its profile in just proportions. The *ladle* is the instrument by which a charge is placed in the chamber or bottom of the piece, and which ought to be in proportion to its caliber. All other instruments which serve either to charge or clean a piece, are to be found in such books as treat on artillery. The largest pieces of canon that are used in battering, do not carry, at the most, balls that exceed thirty-six pounds. Lastly, this science teaches the method of charging with red-hot balls, with cartouches, and all sorts of matters that men have invented to destroy each other. It shows the method of ranging a piece, either horizontally, or to any other degree of elevation, for a rebound, &c.

XXIII. A mortar is a piece of artillery in form of a cannon, but very short, and wide in the caliber, and is designed to throw bombs, grenades, cartouches, stones, and other combustible and murdering instruments. It is mounted on a carriage with very low wheels. Gunnery explains the parts of which a mortar is composed, its caliber, its bombs, and their composition: the art that is sometimes made use of in charging it; the manner of directing it; of cleaning it; and of transporting it from one place to another; the method of making grenades, chain-balls, fire-balls, carcasses, petards, cartouches, &c. And lastly, it explains the manner of constructing and firing of mines. A mine is a subterraneous cavity that

that is charged with a number of barrels or sacks of powder; by setting fire to which, the parts over it are blown into the air. The *chamber* of a mine is the part that is excavated by digging at the end of the canal. The *saucidge* is the train, for which a small opening is left: the part that leads to a mine is called its alley, canal, branch, &c. There are mines royal, serpentine mines, forked mines, globes of compression, &c. Pyrotechny teaches not only the mechanism of all these matters, but also how to calculate the weight with which a mine is loaded; the degree of force that will be necessary to blow it up; the quantity of powder, and all that relates to this subject.

XXIV. (8) FORTIFICATION, or, as it is otherwise called, *Military architecture*, is the science that teaches the method of fortifying a place in such manner, that a small number of troops may defend it for a long time against a much larger number that may come to besiege it. Experience, as well as reason, proves, that there is no place impregnable, or that is defensible against a perpetual siege. A place may be justly said to be strongly fortified, when it can defend itself against an active, skilful, and formidable enemy for some months together, and by that mean render a campaign fruitless, or give time for an army to come to its relief, or save the shattered remains of troops flying before an enemy. The fundamental rules of military architecture are by no means so clear and certain as those of civil architecture. Much here is left to the discretion of the engineer. If the several parts of a fortification are greatly extended, they cannot mutually defend each other by their cannon; and if they be much contracted, they cannot contain a number of troops sufficient for their defence, or they will not have sufficient room to act; the enemies fire will do too much execution, &c. In the method of fortifying, regard should be also had to the method of attack in use, either at a certain time, or among a certain people. So the manner of fortifying, before the invention of gunpowder, was quite different from

from the present; and the method of fortifying a place against the French, or against the Indians, should be also quite different. These variations have given rise to very different systems of fortification: and the greatest masters in this art have pursued different methods; from whence have arose the systems of Coehorn, Vauban, Rimpler, count Pagan, Blondel, and many others; all which deserve a particular study. There are, however, some general rules, which an engineer should constantly keep in view.

XXV. For example; every superior fire will in the end silence one that is inferior. The besiegers have most facility, and most means, of rendering their fire superior. From whence it comes, that every place that can be seen by an enemy, is constantly a place taken. Again; nothing conduces more to discourage the besiegers than the transportation of earth. From these incontestable principles there arise certain general rules; as for example, all the parts of a fortification should be masked as much as possible: the enemy should be opposed by a strong fire; and each part of the works should be so constructed that the cannon cannot be easily dismounted: the enemy should be obliged to transport the earth in every part of their operations, and not find any ready to their hands in the breaches that they make: this has given occasion to some engineers to construct batteries of wood, the parts of which may be carried off before the work is taken; and so of the rest.

XXVI. Among the particular rules of fortification, the following are some of the most material. 1. Every part of the works should be as far as possible capable of resisting the battery of the largest cannon that are ever used in a siege. 2. Every strong place should be so constructed, as to be defensible by the smallest number of men possible. 3. The garrison should have the advantage of the enemy, and consequently should be protected against their cannons, bombs, grenades, &c. whereas the besiegers ought not to find the least shelter in any part of the environs of the place. 4. There should therefore be no high grounds suffered

to remain within cannon shot of the place. 5. There should be no one part of the works that cannot be seen and defended by another part. 6. Therefore, every line in a fortress should have a parallel line to second it, and which should be as much larger than the first as possible. 7. The enemy should be kept from the fortress, as far distant and for as long a time as possible; and every part of the works should be concealed till it be ready to be used against them. 8. The line of defence should be within musket-shot. 9. The attack should be rendered more difficult to the enemy in proportion as they approach nearer to the place. 10. Every part of the fortification should be, as nearly as possible, equally strong. 11. The first part of a fortification, that is to be constructed, should be the raising of a *rampart*, which must go quite round the place. 12. The top of the rampart, which defends the garrison, is called the *parapet*. 13. The parapet is likewise furnished with one or two banks. 14. The ground next the town, at the bottom of the rampart, is called the *terre plein*. 15. The slope of the rampart is called its *talus*. 16. The rampart should not be raised too high, but is to be regulated by the ground that surrounds the fortress: the rampart is sometimes faced with stone work. 17. The form of a rampart is not to be that of a straight line, a circle, square, or polygon; but there must advance from it, at proper distances, works that are called *bastions*. 18. These bastions terminate in angles, and the sides that form these angles are called its *faces*. 19. The part of the rampart between two bastions is called the *curtain*. 20. The bastions must not consist of simple faces, but there must be added two other lines which join them to the curtain, and which are called the *flanks*. 21. The superior part of the flank, which serves to cover the interior, is called the *orillon*. 22. The *berme* is a path or border at the foot of the rampart next the ditch. 23. The *fausse braie* is a way furnished with a parapet and bank at the foot of the rampart, and which runs quite round it. 24. The *ditch* is the hollow ground that environs the rampart

rampart and its bastions, and which should be rather wide than deep.

XXVII. The *out works*, or *advanced works*, are those that are added to the first enclosure, and are constructed on the other side of the ditch of the principal rampart, either to keep the enemy the longer from the body of the place, or to cover the works of the rampart, or to weaken the assailants by the different attacks they must be obliged to make, or for other like purposes. The principal advanced works are, 1. The *ravelin*, which has only two faces, and is placed before the curtain. 2. The *half moon* has, like the bastion, two faces and small flanks, and is placed before the angle of the bastion, and sometimes also before the curtain. 3. From the half moons arise the *counter guards*, by drawing their faces parallel to the faces of the bastions, up to the ditch of the ravelin. 4. The *single tenaille* is a large work, consisting of two faces that form a returning angle. 5. The *double tenaille* is composed of two single tenailles added together. 6. A *horn work* consists of two demi-bastions joined by a curtain. 7. A *crown work* is a double horn work. 8. A *counterscarp* is the most advanced work of a fortress: it consists of a way that runs quite round the ditch, and of a parapet, the talus or exterior declivity of which is insensibly lost in the surface of the field; this way is called the *covert way*, and the parapet the *glacis* or *esplanade*. Sometimes they also call the counterscarp the exterior talus or declivity of the ditch. 9. *Palisades* are stakes of wood pointed at both ends, and about six or eight feet long, with which the works are defended. 10. *Traverses* are parapets, or small epaulments, that are raised transversely on the terre plein or covert way. 11. *Caponiers*, or *casemates*, are hollow ways, about five or six feet deep in the earth, vaulted or covered with wood, and are proof against bombs and carcasses. 12. *Demi-caponiers* are galleries of wood, placed against the parapets, but principally against the glacis; and are covered with planks, or with earth or sand bags. 13. *Counter mines* are subterraneous vaulted passages

passages that are made in the front of the works, and which serve to discover and blow up the enemies mines. 14. The *plan* of a fortification is the delineation of all its works, with their dimensions. 15. The *profile* is the projection of a side view of a fortification, showing the length, breadth, depth, and height of all its parts. 16. *Lunettes* are small works, consisting of two returning angles, and are commonly constructed in ditches filled with water. 17. *Places of arms* are places large and well covered, where the garrison, or a good part of it at least, may rendezvous.

XXVIII. Fortifications are also distinguished into, 18. *regular* and *irregular*: those are said to be regular, where all the sides, and all the angles of the same name, are of the same dimensions; and those are called irregular, where the same sorts of lines and angles vary. 19. *Citadels* are small forts that are placed before large towns, and commonly constructed on some eminence, and are designed either to keep the inhabitants in awe, or to render a fortified place still stronger. 20. *Redoubts* are also small forts or works raised on the plain, either to secure a post, or to cover a retreat, or to defend the lines, or some other such purpose. 21. When such a fort is of a triangular form, or presents only a salient angle, it is called a *fleche*. 22. A fort that is composed all of tenailles is called an *etoile* or a *star fort*. The manner of delineating all these works, not only on paper, but on the ground also, in a word, every thing that belongs to theory and practice of fortification, is to be determined by calculation, and consequently this art justly appertains to the mathematics, which furnishes it with rules for the method of proceeding in every particular.

XXIX. This science teaches also the method of properly attacking and defending a fortified place. We shall here give a brief abstract of the principal rules. 1. The attack of any place must commence by *investing* it, and by guarding all the posts and avenues that lead to it. 2. A line of *circumvallation*

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is to be formed, that is to say, a parapet is to be raised round the camp, with a ditch on the side next the plain. 3. When an enemy is near, or is apprehended to advance to raise the siege, a line of circumvallation is likewise to be raised round the fortified place. 4. Or, if the garrison of the place be strong, lines of *countervallation* are also to be raised. 5. The town should be *reconnoitred* as nearly as possible. 6. All the works that are raised by the besiegers, whether to fortify the camp or to approach the town, are called *trenches*. 7. The *approaches* are the ditches conducted in a ziczac toward the town, and defended by a parapet, and in which they can advance quite up to the counterscarp. 8. It is the common rule to form the attack on that side where they can approach nearest to the town with the most facility. 9. The lines or ziczacs of the trenches must be so directed, that they may not be swept by the cannon of the town, and that they may afford an opportunity of erecting redoubts, or constructing places of arms at the ends of the lines. 10. Between the approaches, they also raise *batteries* for the cannon and mortars. A battery is an elevation with a parapet and battlements or embrasures. 11. By *sapping* is meant digging under the counterscarp, in order to gain a covert way in the ditch. The counterscarp is carried either by this mean, or by surprise, or assault. 12. The way which the besiegers make in the ditch is called the *gallery*. 13. A *breach* is an opening made by the cannon in the rampart: and 14. when it is large enough to admit a sufficient number of men to enter abreast, it is said to be *practicable*; and then every thing is made ready for storming the town: the commander, however, seldom stays till this extremity, but beats the *chamade* before matters are come to this point. The science of fortification teaches, moreover, all the precautions that are necessary to the besieged, in order to prevent the enemies approach, or at least to render it as difficult as possible.

XXX. (9) MECHANICS is the science of the motion of bodies: that is to say, it teaches the method

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of moving any given body, with a greater degree of velocity, or a less degree of power, than can be performed by the simple operations of nature. By *power* is meant that force by which bodies are moved; and by *weight*, any body that is to be moved, or any resistance that is to be overcome: so that the efforts, not only of animals, but of inanimate substances, are comprised under the idea of moving powers; and it is from this principle, that mechanics shews in what manner air, water, fire, men, and other animals, weights, and springs, may be made to produce motion. When an effective motion is produced, the force that produces it is called a *living power*; but when a weight is merely suspended it is called a *dead power* *.

The instruments, that are made use of in communicating motion, are called *mechanic powers*; as
1. The *lever*, which is an inflexible beam or bar of any substance that is used in moving of bodies, by means of a point on which it rests, and which is called its *fulcrum*. This is the origin of all the other mechanical powers, and is contained in all machines either apparently or effectively. 2. The *balance* is nothing more than a lever, whose fulcrum is placed exactly in the middle: it is used in finding the weight of bodies: the Roman balance is that whose sides are unequal, and by which bodies that are differently heavy are poized by the same weight. 3. The *wheel* and *axis* (*axis in peritrochio*) is a circular body that is annexed to a cylinder, and with which it moves round one common centre. When one wheel is to lead another, it is furnished with *teeth* or *cogs*, that are either parallel to its axis, or on the border of the wheel; and which are therefore named common wheels, or cog wheels. When a large wheel moves a small one, the latter is called a *pinion*. 4. The *pulley* is a small wheel with a channel in its edge; round which a rope runs, and by means of a power

* This distinction of living and dead power, though natural enough, is scarce ever used by English writers.

applied to one end of the rope, a weight that hangs on the other end is raised. The part, in which the axis of the pulley turns, is called the *block*. 5. When a plane forms an acute angle with the horizon, it is called an *inclined plane*; and when such a plane is rolled in a spiral figure round a cylinder, it forms, 6. A *screw*: the cylinder, thus channeled, is called the *male screw*. 7. The *wedge* is a body of a hard substance that has three planes which are terminated by two triangles, and is commonly used in cleaving of wood.

XXXI. Every body has three centres, which are, the *centre of motion*, that is, the point round which it will move: the *centre of magnitude*, which is that point by which it may be divided into two parts of equal dimensions: and the *centre of gravity*, which is the point by which it may be divided into two parts of equal weight. The *line of direction* is that line through which the power and weight move when they meet with no obstacle to divert their course; and this line is drawn from the centre of motion to the point where the power or weight is applied. The *horizontal line* is that of which every point is equally distant from the centre of the earth. *Gravity* is that power by which bodies are impelled toward the centre of the earth. When a body is suspended in such manner, that a line, perpendicular to that by which it is suspended, passes through its centre of gravity, it will remain at rest. When the matter of which a body is composed is every where of an equal density, and the body is of a regular figure in all its parts, its centre of gravity and of magnitude will be in the same point. When the line of direction falls within the basis on which a body is placed, it will remain at rest; but if it be out of that basis, the body must necessarily tend to that part on which the line of direction falls. The line of direction of gravitating bodies falls perpendicularly on the apparent horizontal line. When two bodies are placed on the ends of a lever, and its fulcrum is so placed that their distances from it are in reciprocal proportion to their weights, it must necessarily

necessarily remain in equilibrium, for neither of these weights can move the other. These are the fundamental laws of mechanics. The doctrine of the centres of gravity, magnitude, and equilibrium, is sometimes made a separate branch of mechanics, and called *statics*; but, as we would avoid all needless multiplication of the sciences, we have here comprised it under the general title of mechanics. We shall now pass to the description of some of those machines by which it performs its operations in conformity to these laws.

XXXII. What is commonly called an *endless screw*, is a machine composed of a screw, the cylinder of which turns perpetually the same way, on pivots that terminate its axis; the thread of this screw, which is for the most part square, commonly leads as it turns a vertical wheel; and this wheel rolls up a rope on its cylinder, by which a weight is raised. A *jack* is composed of a dental wheel or pinion that is turned by a winch, which raises a large iron rack that is also dented, by the wheel of the pinion taking those of the rack, the upper end of which is hollowed in form of a semicircle. The whole is inclosed in a wooden case bound with iron. The *capstan* is a cylinder placed perpendicular to the horizon; it is turned by four levers or transverse bars, and by means of a cable that winds round the cylinder as it turns, raises the heaviest weights, which are fixed to the end of the cable. The *crane*, is a large machine designed to raise heavy weights to a great height, and to fix them on any desired place by means of a moveable arm. It consists of a large wheel in which a man walks, and which, as it turns, winds up a rope that is guided by two pulleys, one of which is horizontal, and the other perpendicular: to the end of the rope is fastened the weight. The *roller* is a large cylinder that is turned by a winch or handle, and which winds up a rope perpendicularly as the capstan does horizontally, and in like manner raises the weight.

XXXIII. By the aid of these fundamental principles, and of the mechanic powers, this science

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teaches to compound and vary machines to infinity. It calculates the weights, the powers, the resistance, the time, the distance, the strength, and degree of duration of matters and bodies that are employed in the construction of machines; in a word, it does nothing without having first examined and calculated what will be the effect. It teaches the construction of wheels, pullies, pinions, screws, balances, levers, &c. of every sort. It points out the method of constructing wind and water mills of all kinds, and for all uses; and instruments of every sort for cultivating the earth, or regulating the waters, and forming of dykes, causeways, sluices and piers. It teaches the formation of machines that are to be worked by air, water, fire, or vapor, men, horses, or other animals; by impulse, by accelerated or accumulated force, or by the spring of bodies; and it lastly shows in what manner all these powers may be augmented or diminished. In all these matters it has constant regard to two maxims: the one is, that in all mechanical operations, what is gained in time is lost in power, and what is gained in power is lost in time: the other is, that the parts of bodies not being precisely smooth, all kinds of machines lose part of their force by the *friction* which arises from these inequalities wherever they touch, and the weights with which they press each other; and sometimes also from the mutual attraction there is between bodies. And in the last place, it considers the different advantages or disadvantages that arise from the different angles in which a machine is made to act, with regard to the weight and power.

XXXIV. (10) HYDROSTATICS is the science of the effects that fluids have on the weight of bodies: every body whose parts do not adhere, but easily recede from each other, is called a *fluid*. This property in bodies is easily distinguishable by that facility with which our bodies move in them; by their dividing, in consequence of their natural gravity, into drops; by their taking instantly the form of the vessel that contains them; and by the immediate separation
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of their parts when they are not held together. A body, that is *specifically lighter* than another, is one that occupies the same space, but is of less weight; and a body, *specifically heavier*, is, on the contrary, one that is of the same magnitude with another, but of greater weight. A *resisting force* is that which destroys, either in whole or in part, the effect of another force. Bodies press against those on which they gravitate, and endeavour to displace them. A body, that is heavier than another, endeavours to draw with it the lighter body toward the centre of the earth. Two or more bodies, of equal weight, press or gravitate equally. When two or more bodies are equally great, but of unequal weights, the heaviest will descend with the greatest velocity, or, if it be impeded, will press with the greatest force. When two bodies gravitate equally, but in opposite directions, they will both remain at rest. But, if the pressure of a body be greater than the resistance, the motion will be in the line of direction of the strongest body. When a body is immersed in a fluid that is lighter than itself, it will lose as much of its weight as is equal to the weight of a quantity of the fluid of the same dimensions.

XXXV. These are, nearly, the fundamental principles on which hydrostatics builds all its axioms, its laws and operations. It calculates and determines in consequence, for example, to what height water, or other liquor, ought to rise in two cylinders or pipes that communicate with each other: the reciprocal heights to which liquors of different densities ought to rise: it teaches to find the weight of any fluid, as for example, the liquor in a cask; and the different weights of different fluids; as also the weights of different fluids mixed together; to calculate the force necessary to draw any body out of the water, when its weight and magnitude are given; to construct an instrument that will show how much salt is contained in a given quantity of salt water; to find the force necessary to keep a body in a fluid that is lighter than itself, as for example, a piece of wood under water;

and a thousand other like matters, both useful and entertaining. It even extends its subtile inquiries to anatomy and physiology, and determines the laws of those fluids that enter into the composition of the human body.

XXXVI. We cannot, in this place, avoid giving a table of the specific gravity of certain bodies as they have been determined by the most accurate observations. When the weight of a piece of gold is equal to - - - - - 100

the weight of the following bodies of the same magnitude will be as under :

Quicksilver	-	-	-	-	71 $\frac{1}{2}$
Lead	-	-	-	-	60 $\frac{1}{2}$
Silver	-	-	-	-	54 $\frac{1}{2}$
Copper	-	-	-	-	47 $\frac{1}{3}$
Iron	-	-	-	-	42
Pewter	-	-	-	-	39
Tin	-	-	-	-	38 $\frac{1}{4}$
Loadstone	-	-	-	-	26
Marble	-	-	-	-	21
Common stone	-	-	-	-	14
Crystal	-	-	-	-	12 $\frac{1}{3}$
Water	-	-	-	-	5 $\frac{1}{3}$
Wine	-	-	-	-	5 $\frac{1}{4}$
Wax	-	-	-	-	5
Oil	-	-	-	-	4 $\frac{3}{4}$

This difference of gravity or weight arises merely from their different degrees of density, from their porosity, and the fluid matter with which those pores are filled.

XXXVII. (II) HYDRAULICS is the science of the motion of fluids. It is founded on the principles of physics in general, and on hydrostatics and aerometry in particular. It must, however, be confessed, that the almost only use that is made of hydraulics is in the constructing of all sorts of machines for raising of water, either for pleasure or for particular uses : and this is the method that we also shall here pursue ; still hoping that the most able philosophers will apply themselves to the further investigation of the laws

laws of the motion of fluids in general, which would throw great light on hydraulics, and which seems not to have made an equal progress with the other sciences. We can therefore only give a very succinct description of the principal hydraulic machines, and of the effects they produce. In order to render our explanations the more clear, we shall observe here, that by the word *pipe* we mean every cylinder in general that is hollow within.

XXXVIII. The principal hydraulic machines are,
1. The *screw of Archimedes*, which is composed of a leaden pipe turned round a wooden cylinder in a spiral form, and in an angle of 45 degrees; one end of it is put into the water that is to be raised, and at the other end is a handle or wheel, by which it is turned: 2. The *chain pump* is a large pipe of wood, through which a chain or rope is passed, to which are fastened leathern bowls or buckets, that raise the water from the well into which one end of the pipe is put, to the height of the other end, from whence it is discharged into a reservoir: 3. The *double chain-pump* has much resemblance to the foregoing; but with this difference, that the buckets are fixed to a double chain, which turning round, each bucket fills as it passes through the water, and empties as it passes the top of the machine: 4. The *drawing wheel*, the ends of whose spokes form a sort of buckets, which, as they pass through the water of a river or pond, raise it to the height of the diameter of the wheel: 5. The *common pump*, which consists of a hollow cylinder, with a piston or sucker, and a valve, by which the water is either drawn or forced to a certain height: 6. The *compressing engine*, which is composed of two hollow cylinders with forcing pistons, by means whereof the water is forced to ascend and discharge itself.

XXXIX. It is by the aid of these simple machines that the most compound are constructed; by which water is raised from the bed of a river to the summit of a mountain; and that those large reservoirs are formed, which furnish a whole city with water, or

adorn its gardens with fountains and cascades : hydraulics teaches likewise the construction of these, and the means of making them spout, or fall, in numberless different forms ; and the various methods of communicating refreshing showers to our gardens : the method of forming *siphons*, or curved pipes, whose sides are of unequal lengths, and which are of use to determine, by many experiments, the nature of water and other liquors, as well as to convey them from one place to another : the contriving of basons or fountains, which furnish water by flowing and stopping of themselves : to make water spout by the compression of the air : to form fountains that shall play by the means of heat ; or to construct an altar in such a manner, that the doors of the sanctuary shall open of themselves when the victim begins to burn, and shut as soon as it is consumed : and a thousand other inventions by which water may be applied to the greatest advantage, either in useful arts and manufactures, or in the conveniencies or pleasures of life. We must observe here, that in all the various operations of hydraulics, as well as in mechanics in general, the highest perfection of any machine consists in producing the greatest effects by the least efforts possible ; and the greatest imperfection is, to produce only common or trifling effects by the greatest efforts ; as appears, by the way, in that famous and imposing machine at Marly.

XL. (12) AEROMETRY is the science of measuring the air. To measure, is to reduce any quantity to unity, and to compare other quantities of the same kind to that unity. Therefore, when we would measure the heat of the air, we must reduce a certain degree of that heat to unity, and compare the proportion it has to that unity ; that is, to see how many times it must be taken to produce the degree you would find. By the word *air*, we understand that fluid which surrounds every part of the earth that is not occupied by some other body, though it is not visible. When you move your hand briskly toward your face, without touching it, in a space that is seem-

seemingly void of matter, you find that there is some other body which touches your face. There is, therefore, in that space a very subtile matter, seeing that it is invisible; and whose parts do not strongly adhere to each other, seeing that it does not impede the motion of bodies: that is to say, a fluid matter. There is therefore such a body in nature as air. A body is said to be compressed, when the matter of which it consists is reduced into a smaller compass: and it is said to be dilated, when its matter is made to occupy a larger space. That matter is said to be *proper* to a body, which makes part of its density; that moves along with it, and in its motion attacks other bodies: and that matter is said to be *foreign*, which, on the contrary, flows freely thro' another body. That force which renders the air compressible, and which enables it to dilate again when the compressive force is removed, is called an *elastic force*.

XLI. These few definitions and principles serve as the foundation of this new science called *aerometry*, which the celebrated Wolff has reduced into a system, and which not only explains some of the most important phenomena of nature, but teaches likewise the method of constructing the most useful and most curious instruments that appertain to physics: such as the *wind balance*, which is contrived to show the force of the various winds: also all the different *pneumatic instruments*, by which many curious experiments are performed; such as weighing the air, and determining its gravity at certain altitudes, and its different degrees of compression, or its density and rarefaction. It establishes moreover the principles on which are founded the construction of barometers, and of thermometers, of every kind; as well as the manner of making them: it explains likewise the effect of gunpowder, and many other similar matters.

XLII. (13) *OPTICS*: this term, taken in the most extensive sense, signifies a science that treats of vision in general; and is divided into *optics* properly so called, *catoptrics*, *dioptrics*, and *perspective*. The faculty of vision is subject to certain laws, according

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to which objects appear to be sometimes what they really are, and sometimes different. Philosophers, those interpreters of the immutable laws of nature, have therefore assiduously investigated the principles of vision, and have formed of it that science of which we shall now explain the different parts.

XLIII. *Optics, properly so called*, is therefore the science of all visible objects, in as much as they are visible by the rays of light that proceed from them, and which strike the eye in right lines. We call that *light* by which we are enabled to discern all objects that surround us: the want of a portion of this light we call *shade*, and the total privation of it *darkness* *. As without light no object can be discerned, so the more the ingress of light is impeded, the greater will be the degree of obscurity. If in a place that is quite dark, the light be made to enter by a small hole, you will perceive a luminous ray that will dart in a right line: and as the progression of light is made in right lines, it follows, 1. That we can discern no object that is not placed opposite to our sight in a right line, unless the ray be turned from its direction in its course: 2. That when several rays proceed from one point, they spread in proportion as they extend in length; which occasions the light to grow weaker. If you stop the ray of light that darts into a darkened room, by a mirror, in such a manner that it shall make with it a right angle, it will be reflected on itself; but if you so place the mirror that the ray shall make with it an obtuse angle, it will fly off to the other side, and the ray, so flying off, will form with the mirror an equal angle with that which it forms when falling on the mirror. This repercussion of rays is called their *reflection*. There is another property that rays have, which is proved by a thousand experiments, and which is, that they turn out of their direct course in passing from the sun into air, from air into glass, and from glass into water, &c. It is for this

* We have already said, in the chapter on Physics, that light is fire itself.

this reason, that an oar, when in the water, appears crooked to him who holds it in his hand. When a ray of light passes therefore from a more dense to a more rare, or from a more rare to a more dense medium, it is turned from its direction; and this deviation is called its *refraction*. The several angles formed by these motions of a ray are called its *angle of incidence*, *angle of reflection*, and *angle of refraction*. Any one point in an object may be seen from every place to which a right line can be drawn from that point. Therefore, from every point in an object flow an indeterminable number of rays.

XLIV. After having explained and established these principles, optics passes to the anatomy of the eye, so far as it regards vision. The eye is composed of coats and humours, that are called, 1. The conjunctiva, which is the common tunicle of the eye: 2. The cornea: 3. Sclerotica: 4. The choroides, in which is the pupilla; 5. The crystalline humour: 6. The iris: 7. The vitreous humour: 8. The aqueous humour: 9. The retina, &c. An accurate knowledge of the structure of the eye is of great importance in optics. There are drawings and models made of it; and in winter they congeal the eye of an ox, and afterwards cutting it through the middle, the idea that is thereby formed of it becomes more clear and sensible. From these principles of light, and observations on the structure of the eye, optics draws its fundamental rules; such as, 1. That when the rays of light are parallel, and receive no obstruction in their passage, the light is every where equally strong: 2. When the rays are dilated or contracted, the light is more or less strong, in proportion to the squares of the distances: 3. The air weakens the light that passes through it: 4. When the light falls on an opaque body, it always casts a shade behind it, which is opposite to the light: 5. When the luminous body, and that which is enlightened, are globes of equal magnitude, the shade will be cylindrical: when the luminous body is greater than that which it enlightens, the shade will be of the figure of a cone: but if the
luminous

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luminous body be smaller than the other, the shade will be the lower frustum of a cone: 6. A body appears more obscure at a distance than near. 7. All objects that are seen under the same angle appear of equal magnitude: those which are seen under a greater angle appear greater; and those seen under a less angle appear less: 8. The apparent magnitude of any object is the angle under which it is seen: 9. When the images of two objects are perceived by the eye at the same time, they appear to be near to each other: 10. A torch, or other luminous body, appears greater at a distance than when near: 11. When the space that is passed over by a body in a certain time, is insensible, the motion is not perceptible, and the body appears to be at rest: 12. Bodies at rest frequently appear to move; and those that go forward, frequently appear to go back, &c.

XLV. Optics likewise makes numberless experiments on colours, according to the celebrated system of Newton; of which we have already treated in the chapter on physics. It collects the rays of light into beams or large masses, and then separates them by the aid of the prism, and accounts for all their different modifications: and for these purposes it makes use of instruments, experiments, inferences, and calculations.

XLVI. CATOPTRICS is that science which explains the nature of reflected light, and principally by the means of *mirrors*. By a mirror, we understand every substance whose plane is smooth and polished, and whose body is opaque. Thus water when at rest, polished metal, and glass when made black on the opposite side, are mirrors. The surface of mirrors is either plane, convex, or concave. Convex mirrors are commonly either spherical, cylindrical, or conical. When you place yourself opposite to a mirror, the rays, that go from your face in a parallel and perpendicular direction, are reflected in the same direction, as a ball rebounds from the floor. If you see, in this mirror, an object that is on one side of you, the rays that proceed from that object are reflected from
the

the other side, and form an angle with your eye: the former is called the angle of incidence, and is equal to the angle of reflection. These lines of incidence and reflection likewise explain, by the principles of catoptrics, the reason why objects are diminished by the convex mirror, and augmented by the concave. This science teaches also the method of polishing plane glasses, and of making them black and opaque, and consequently mirrors. It likewise shews the reason why mirrors, placed opposite to each other, or in different positions, reflect the objects in different directions, or in opposite sides. It teaches moreover the method of making spherical and cylindrical mirrors, and shews the reason why these represent objects as long and narrow; to make conical mirrors, and explains the reason of their objects appearing long, narrow, pointed at top, and diverging at bottom; the manner of constructing the moulds in which to cast metallic concaves; the method of making glass concave mirrors, &c.

XLVII. A ray of light, falling on a spherical convex mirror, parallel to its axis, but sixty degrees below it, will unite with the axis itself after reflection, at a distance less than a fourth of its diameter, or half of the radius of the mirror. Now the rays of the sun being all parallel, it follows, that two, which fall separately on the superficies of such a mirror, will concenter at a very small distance; and as by this union their power is augmented, it is not surprising, that, though before they only gently heated, they now united burn, and even melt hard bodies, as ores or metals, in proportion as the mirror is large and consequently collects a great number of rays in one common focus: it is for this reason, that such mirrors are called *burning glasses*. The most celebrated are those of Archimedes among the ancients, and M. Tschirnhaus among the moderns. The effects of the former were even treated as fabulous, till a few years since, M. du Thay at Paris, and M. Knutson professor at Königsberg, restored at the same time this famous instrument of Archimedes, by means of 64
plane

plane mirrors, so disposed that all their foci were united in one point, which produced so great a heat, as to inflame wood smeared with pitch at an amazing distance. Catoptrics therefore shews that the focus is that point where the rays of light are united, whether by reflection or refraction: that these rays burn only because they are collected together: that a great mirror, therefore, must have more force, and burn at a greater distance, than a small one: that every such mirror should be under 30 degrees, and that commonly they are not more than 18: that mirrors may be made of hard wood, gilded and polished, or of plaister, or even of paper: it shews moreover the manner by which the rays, reflected from a burning mirror, may be concentrated in one that is concave, and by that mean burn or inflame a body: by what means a distant object may be illuminated; as for example, the dial of a clock from a distant window, by placing a lamp or candle in the focus of a concave mirror: why an object placed in such focus cannot be seen in the mirror itself: that in a concave mirror the reflected ray is equally distant from the centre with the incidental ray: the reason that when any object is placed higher than the centre of a burning mirror, it appears reversed, diminished, and detached, as if in the open air: why, when the eye is placed at a greater distance from the mirror than its semidiameter, and the object between them at the distance of one fourth of its diameter, the figure will appear very large, upright, and behind the mirror. All these phenomena, and many more, catoptrics describes, clearly explains, and likewise shews the method of constructing the several instruments by which they are exhibited.

XLVIII. DIOPTRICS is the science of all the effects in vision that arise from the *refrangibility* of the rays of light. It begins by examining the degrees of refraction that the rays suffer when they pass from the air into glass, and from glass into air; or, in short, all the refractions that they undergo in passing through a more rare or more dense medium. Thus Newton,

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in his optics, shews that the proportion of the *sine* of the angle of inclination, to the angle of refraction in air, is as 3851 to 3850; in glass, as 31 to 20; in rain water, as 529 to 396; in spirit of wine, as 100 to 73; in common oil, as 22 to 15; in a diamond, as 100 to 41. This science has been cultivated since the invention of lenses only; which shew the surprising effects of refraction. In order to form a just idea of this science, we must begin by remarking that a *convex lens* is a glass whose two sides, somewhat raised, are parts of a hemisphere, or of which one side is convex and the other plane. A *concave lens*, on the contrary, is that whose sides are hollowed in form of part of the concavity of a sphere; or of which one side is concave and the other plane. Dioptrics explains all the effects of refraction when the light falls in any direction on these convex or concave lenses. And this is the foundation of all refracting optical instruments.

XLIX. The *telescope* is an optical instrument, by which distant objects may be distinctly discerned. This instrument was invented about the beginning of the seventeenth century. It is true that *John Baptist Porta*, a Neapolitan, says in his *natural magic*, which was published in 1589, *Si utramque (lentem concavam & convexam) recte componere noveris, & longinqua & proxima majora & clara videbis*. They were not however constructed, till a long time after, in Holland; some say by *John Lipperstheim*, a spectacle maker, at Middelbourg in Zeeland; others by *James Metius*, brother to the celebrated professor *Adrian Metius* of Franequer; others again attribute the invention to *Galileo*, though he says himself *, that he took the hint from a report that a German had invented an instrument, by means of which, and with the assistance of certain glasses, distant objects might be distinguished as clearly as those that were near. *Peter Borel*, in his tract *de vero telescopii inventore*, is of opinion, that another spectacle maker

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* In his treatise intitled *Nuncius siderius*.

of Middelbourg, named *Zacharia Johnson*, made this discovery by chance, about the year 1500; that *Lippersheim* had imitated him after many trials, and that he instructed *Metius*. It is certain, however, that *Galileo* in Italy, and *Simon Marius* in Germany, were the first that applied the telescope to the contemplation of celestial objects.

L. Telescopes have commonly two glasses; that which is toward the object, is called the *object glass*, and that next the eye, the *eye glass*; the former is convex, and the latter concave. There are some tubes that have four glasses, which are all convex, and of which one is for the object, and the other three for the eye: these are designed for land prospects. For celestial objects, this telescope has one convex object, and one convex eye glass. The *Newtonian telescope* has, moreover, a mirror, by which the objects are elucidated: this is also called a *reflecting telescope*, and dioptrics teaches the manner of constructing it. In these instruments great regard must be had to the focus, and to the point where the rays diverge from the glass *. The *microscope* is a short optical instrument, that serves to show the small parts of objects, which it does by magnifying them to a great degree. The *solar microscope* magnifies them still far more by throwing the image of the object on a wall, in the manner of the magic lantern. The *anatomical microscope*, for the invention of which we are obliged, principally, to the late M. *Liebkühn*, who has given the description of it in the memoirs of the academy of Berlin, is chiefly used in observing the circulation of the blood. The *multiplying glass*, which is also sometimes called the miser's glass, is cut into a number of planes, and shows as many objects as it has faces. The magic lantern, the camera obscura, the common spectacles, prisms, and many other like instruments, that are adapted to improve vision, all belong

* By *diverging* is meant the separation of the rays of light from each other after refraction; and by *converging*, their drawing together toward one point.

belong to this science: which teaches also, the method of constructing them; the knowledge of the most proper glass, the manner of polishing and cutting it, &c. In a word, it describes the mechanism, and explains the appearances that arise from the use of all the various kinds of dioptric instruments. It is certain, however, that this science is still susceptible of great improvement; and we should not be surpris'd to see, perhaps, in a short time, such new inventions as are capable of carrying telescopes to so great a degree of perfection, as to be able to make yet great discoveries among the celestial bodies; and, for example, to have a much more distinct view of the body of the moon than we can at present pretend to*.

LI. PERSPECTIVE is the art of representing visible objects, as they appear when seen from a certain distance and certain altitude. For this purpose, it is necessary that the rays, reflected from the picture of an object, fall on the eye in the same manner as they would if that object itself were observed from a given height and distance. The ground, on which the representation is to be delineated, is supposed to be transparent, generally perpendicular to the horizon, and placed between the eye and the object. The *point of view* is that from which a straight line, that is parallel to the horizon, may be drawn from the eye to the table. The *fundamental line*, or *base*, is that on which the table rests. The *horizontal line* is
a straight

* Sir I. Newton seems not to have been very sanguine in these expectations. If, says he, the theory of making telescopes could at length be fully brought into practice, yet there would be certain bounds, beyond which telescopes could not perform. For the air, through which we look upon the stars, is in a perpetual tremor; as may be seen from the tremulous motion of shadows cast from high towers, and the twinkling of the fixed stars.—Long telescopes may cause objects to appear brighter and larger than short ones can do, but they cannot be so formed as to take away that confusion of the rays which arises from the tremors of the atmosphere. The only remedy is a serene quiet air, such as perhaps may be found on the tops of the highest mountains, above the grosser clouds. *Optics*, B. 1. *prop.* 7. *prob.* 2.

a straight line at the top of the table, drawn parallel to the base, and passes through the point of view. The *point of distance* is a point in the horizontal line, which is at the same distance from the point of view as it is from the eye.

LII. By the aid of these few definitions, and of geometric calculation, this science teaches to reduce into perspective all horizontal plans, whether they be rectilinear figures, simple or compound, circles, or of any other form whatever; all solid bodies; all buildings, with their various parts; all the shades of bodies, whether they be such as are illuminated by a lamp or other small light, and where the shadows diverge, or the shade of a body is cast upon a wall or other body, or by having the altitude of the sun given, the shade of a body in perspective, when the sun's rays fall parallel on the body where it is placed; to find, by the distance of the sun given behind the table, the figure and length of the shade of different bodies, according to their vertical plans and their height above the basis on which they rest: to trace the shade of a body thrown by a light that enters at a window; and to draw all these objects with a mathematical accuracy. There is, beside, a *linear perspective*, which teaches the true method of shortening the lines and parts of building, and which is done by the aid of geometry: an *aerial perspective*, which depends on the art of painting, and in which distances are expressed by different tints and shades; and lastly, a *specular perspective*, which shews, by the means of different spheric mirrors, those objects which appear on the canvass totally confused, in a form that is quite regular. Among a great number of treatises on perspective, that of M. Desargues appears to be the most complete.

LIII. (14) ASTRONOMY is the science of our planetary world, and of all the revolutions that arise in it. We do not make use of the word *universe*, because that conveys an idea too vast and indefinite; for by the term *planetary world*, we understand that part only of the universe that contains those celestial
bodies

bodies of which we have some knowledge, and which alone can have the least connexion or influence, either direct or indirect, on this our globe. For what do we know of the more distant parts of the world? Astronomy can at best but conjecture concerning them. The celestial vault may be contemplated after two manners; either as it appears to our *sight*, or as it is conceived by our *understanding*; and it is for this reason that astronomy is divided into two parts: the first of which, called *spherical*, shows the manner in which the planetary world appears to our sight, as we are placed on the earth, and when we examine it according to the laws of appearances that are observed by the inhabitants of this globe. The other, called *theoretical*, teaches the true structure of the universe, that is, the nature and properties of the celestial bodies, and the true laws of their motions. We shall see, that in the first part, the appearances have as necessary a connexion among themselves, as have the realities.

LIV. When we regard the heavenly bodies, they all appear to us to be equally distant; the firmament appears to our sight as a vault, as a concave sphere, in the centre of which we are placed, and in the internal superficies of which are fixed the stars, as so many luminous points. When we consider the celestial appearances in this manner, it follows, that we can see only a part of this sphere and what passes in it, at one time, and that the rest remains hid from our sight. We observe likewise, that one star does not change its position with regard to another star, but that the whole moves together; and that some are continually disappearing on one side of the horizon, while new ones appear on the other side: and as we remain continually on the same spot, the whole firmament seems to move round the earth; but we are not to conclude from thence that it does so, because there would be precisely the same appearances if the earth moved: however, as this part of astronomy concerns appearances only, no inconvenience can arise

arise from supposing that the firmament, with all its stars, actually moves round the earth.

LV. In order the better to understand these matters, a globe is formed, on which are depicted the stars, at their proper distances, as they appear in the heavens; and certain imaginary circles are described on the face of this globe. It is called a *celestial globe* or *sphere*. The two points, on which the firmament appears to move round the earth, are called *poles*. That which is in the part of the globe that is visible to us, is called the *artic* or *north pole*, and that which is opposite to it is called the *south* or *antartic pole*. The line, that goes from one of these poles to the other, is called the *axis of the world*. The *equator* is an imaginary circle that is in the midway between the poles, and consequently divides the globe into two equal parts; that of the north and that of the south. The *zenith* is that point in the heavens which is directly over our heads, and the *nadir* is the point that is directly opposite to it in the other hemisphere. The *meridian* is a circle in the celestial globe, which passes through both poles and the zenith and nadir: there are therefore many meridians. The *rational* or *true horizon* is a circle on the globe distant from the zenith, in all its points, 90 degrees: it separates the superior from the inferior hemisphere. The *apparent horizon* is a circle that bounds that part of the celestial hemisphere which can be seen from the surface of the earth. If on a plane, parallel to the horizon, a line be drawn parallel to the diameter of the meridian and the horizon, it is called a *meridian line*, or simply a *meridian*, and it will cut the meridian and horizontal superficies. When a star first appears above the horizon it is said to rise, and when it disappears it is said to set. That part of the horizon on which the stars rise, is called the east, and in particular that point of the horizon which is 90 degrees distant from the meridian: the part of the horizon which is opposite to that, and where the stars set, is called the west; when the east is on the right and the west on the left, the meridian line which is
before

before you shows the north, and the opposite part behind you is called the south. All these four points are called by the common name of *cardinal points*. The *diurnal circles* are those which the stars describe in their courses round the earth on the immoveable superficies of the celestial sphere. Astronomy teaches to find the meridian line by the assistance of an instrument and calculation.

LVI. When in the night you observe the moon, and find her placed near to some star, if you repeat the observation the succeeding night, you will not find her near the same star as before, but some other, that the preceeding night was placed more to the east of the moon: and at the end of about twenty-seven days, you will find her placed almost in the same part of the heavens as when you made your first observation. So that the moon appears to finish her course round the celestial sphere in about twenty-seven days. If you attentively observe the stars that are near the west side of the horizon, soon after the sun is set, and on the east a little before he rises; and if you continue your observations, you will find, after a short time, those stars near the setting sun that were before more to the east, and in like manner you will see other stars precede the rising sun. At the end of a year you will find, at the east and west parts of the horizon, precisely the same stars as when you first observed: and by this the sun appears to move round the earth, from west to east, in the space of a year. Beside the sun and moon, you will find five other heavenly bodies which do not always remain in the vicinity of the same stars, but after some time appear near others that were before at a great distance from them toward the east. These are called *Saturn*, *Jupiter*, *Mars*, *Venus*, and *Mercury*, and are denoted by these characters ♄ ♃ ♂ ♀ ☿. The Sun is marked thus ☉, and the Moon thus ☾. Saturn completes his course round the heavens in about thirty years, Jupiter in twelve, Mars in two, Venus and Mercury, with the Sun, in a year.

LVII.

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LVII. The circle, which the sun seems to describe in his course round the heavens, is called the *ecliptic*. Now as the sun twice in the year passes the equator, and the rest of the time is either above or below it, the ecliptic is represented on the celestial globe as a circle that cuts the equator in two points, and divides it into two semicircles. The ecliptic is in reality divided, as in every other circle, into three hundred and sixty degrees, but with this difference, that these degrees are not counted in continued progression, but the whole of the circle is divided into twelve parts, which are called the *twelve signs of the Zodiac*, and are named, *Aries* ♈, *Taurus* ♉, *Gemini* ♊, *Cancer* ♋, *Leo* ♌, *Virgo* ♍, *Libra* ♎, *Scorpio* ♏, *Sagittarius* ♐, *Capricornus* ♑, *Aquarius* ♒, *Pisces* ♓. Each sign therefore occupies thirty degrees. The stars, which always preserve the same distance from each other, are called *fixed stars*; and those which approach and recede from the others, are called *wandering stars* or planets: the names of these we have given in the preceding section. As it has been found that the planets do not move in the ecliptic, and like the sun, at some particular times only, in the equator, and others either above or below it, there have been drawn two other circles, the one on its north, and the other on its south side, and each at ten degrees distant from it, and this space includes the course in which the planets perform their career round the heavens: it is called the *Zodiac*, and is divided, like the ecliptic, into twelve signs. From the points where the signs of Cancer and Capricorn begin, are drawn two circles parallel to the equator, one of which is called the *Tropic of Cancer*, and the other the *Tropic of Capricorn*. These two tropics, therefore, are the diurnal circles the sun appears to describe on the days he enters those signs. The two circles on the globe, which the poles of the ecliptic describe about the poles of the world, are called the *polar circles*.

LVIII. A *vertical circle* is that which encompasses the globe, and passes through the zenith and nadir; the meridian therefore is a vertical circle. Every star
or

or planet is continually in some vertical circle. The poles of the horizon are the zenith and nadir : a vertical circle therefore is perpendicular to the horizon. The elevation of a star is the arch of a vertical circle that is contained between the star and the horizon. It follows, that the meridian height of a star is an arch of the meridian contained between the centre of the star or planet and the horizon. When you see the sun rise exactly on the point of the east, you will find when he sets, by having measured the time, that he has been just twelve hours above the horizon : you will perceive moreover, that the stars which are in the equator, are always exactly twelve hours above the horizon ; it follows therefore that the semi-diurnal circle of the sun and these stars, is above the apparent horizon. From these indubitable principles astronomy draws numberless consequences ; and by the aid of a *quadrant*, with which it makes its observations, and by the trigonometrical calculations, it measures the heights of the heavenly bodies : and by knowing that the distance of the pole from the equator is equal to 90 degrees, it finds the elevation of the pole in every part of the globe ; it likewise observes when the stars arrive at the meridian, &c.

LIX. When a circle passes through the poles and a star, that arch of it, which is contained between the star and the equator, is called the star's *declination*. Astronomy teaches to find the declination of each star, or its distance from the equator ; to find the greatest declination of the ecliptic, the angle it forms with the equator, or the *obliquity of the ecliptic* ; and when the obliquity of the ecliptic is given, to find the declination of each of its points ; by having the elevation of the equator, and the meridian height of the sun, to find its place in the ecliptic, &c. The *right ascension* of the sun, or a star, is that degree of the equator which rises with the sun or star, in a *right sphere* ; that is, where the poles of the equator and of the horizon coincide, as in all places under the equator : *oblique ascension*, or *descent*, is the degree of the equator that rises or sets

with the sun or a star in an *oblique sphere*; that is, where the poles of the horizon and the equator do not coincide, as in every part of the globe except under the equator. These definitions likewise are of use in solving a great number of astronomical problems; as in calculating, by having the place of the sun in the ecliptic given, the length of the day, &c.

LX. The *azimuth* of a star or planet is the arch of the horizon contained between the vertical circle that passes through that star, and the meridian of the place. The distance of that point where the sun rises or sets each day, from the point of due east or west, is called its *rising* or *setting amplitude*. The distance between any two stars is measured by an arch of a great circle that passes through their centres. When a great circle passes through the pole of the ecliptic and the centre of a star, the arch of that circle, which is contained between the star and the ecliptic, is called the *latitude* of that star: and the arch of the ecliptic between the first point of aries and the circle, that passes through the ecliptic, is called the *longitude* of that star. It is by finding these longitudes and latitudes that the places of the stars on the celestial globe are determined: and it is by this means also that tables of longitude and latitude (which are called *catalogi fixarum*) are composed, and in which its proper station is assigned to every star in the heavens.

LXI. Among the ancients, *Timocharis* and *Arystillus*, and after them, *Hipparchus*, who lived 140 years before the Christian æra, made many observations relative to these matters. *Ptolemy*, about 140 years after the birth of Christ, continued them, by endeavouring to rectify the catalogue of *Hipparchus*. These first guides have been followed by the moderns. *Tycho Brahe*, the landgrave *William of Hesse*, *Kepler*, *Edmund Halley*, *John Nevel Riccoli*, *Gregory*, and above all the renowned *Flamsteed* in England, have laboured in the same pursuit. The last has regularly disposed, in his *Historia Cœlestis*, more than two thousand six hundred stars. To reduce all these stars
into

into a catalogue, and so to dispose them that they might be easily distinguished in the heavens, the whole celestial host has been ranged in *constellations*, to which particular names have been given. For beside the division of the zodiac into twelve signs, of which we have already given the names in the 67 sect. there are in the northern hemisphere the following constellations: *Ursa minor*, *Ursa major*, *Draco*, *Cepheus*, *Canes venatici*, *Bootes*, *Corona borealis*, *Hercules*, *Lyra*, *Cygnus*, *Lacerta*, *Cassiopeia*, *Camelopardus*, *Perseus*, *Andromeda*, *Triangulum*, *Triangulum minus*, *Musca*, *Auriga*, *Pegasus*, *Equuleus*, *Delfin*, *Vulpecula*, *Anser*, *Sagitta*, *Aquila*, *Antinous*, *Scutum Sobieskianum*, *Serpentarius*, *Serpens*, *Mons Menalus*, *Coma Berenices*, *Leo minor*, and *Lynx*. In the southern hemisphere are, *Cetus*, *Eridanus*, *Lepus*, *Orion*, *Canis major*, *Monoceros*, *Canis minor*, *Argo navis*, *Hydra*, *Uranix sextans*, *Crater*, *Corvus*, *Centaurus*, *Lupus*, *Ara*, *Corona australis*, *Piscis austrinus*, *Phœnix*, *Grus*, *Indus*, *Pavo*, *Apus*, *Triangulum australe*, *Crux*, *Musca*, *Chameleon*, *Robur Carolinum*, *Piscis volans*, *Toucan* or *Anser Americanus*, *Hydrus*, *Xiphias* or *Dorado*. There are, beside these, certain stars that have particular names, as *Arcturus* between the legs of bootes; *Gemma*, a bright star in the middle of the crown; *Capella cum hædis* in the shoulder of auriga; *Palilitium* or the bull's eye; the *Pleiades* on the back, and the *Hyades* on the forehead of the bull; *Castor* and *Pollux* on the heads of gemini; *Proserpina* and *Afini* in cancer; *Regulus* or the *Lion's heart*, *Spica Virginis* in the hand of the virgin; *Vindimatrix* on her shoulder; *Antares* or the *Scorpion's heart*; *Formahant* on the throat of piscis austrinus; *Regel* in the foot of orion, and *Alcor* on the tail of ursa major. In order to know these stars and their places in the firmament, it is necessary to ascend some observatory or eminence on a clear night, and to observe them, in company with some one skilled in these matters. For the rest, the fables of the ancient poets concerning the stars, and the fancies of some modern Christian astronomers, who have given them names borrow-

ed from the holy scriptures, do not deserve the least attention when we would treat seriously on this science.

LXII. They reckon also among the constellations *via lactea*, the milky way, or *galaxy*, which surrounds the whole celestial sphere; and passing by *calliopea*, *perseus*, *auriga*, the feet of *gemini*, the club of *orion*, the tail of *canis major*, the ship *argo*, the feet of *centaurus*, the altar, the tail of *scorpio*, the feet of *ophiacus* or *serpentarius*, the bow of *sagittarius* and *cygnus*, forms a luminous tract or band. The ancients made many whimsical conjectures concerning it; but since the heavens have been observed with telescopes, this milky way has been found to derive its splendor from an innumerable number of small stars assembled within that band. From the different apparent lustre of the stars, they have been ranged into different classes, and are called stars of the first second, third, fourth, fifth, and sixth magnitude. There are moreover certain *nebulous stars*, each of which appears to the eye like a luminous spot, but when seen through a telescope, is found to consist of an assemblage of small stars. We must observe here, that the firmament, when observed with a telescope, is found to be vastly more numerous in stars than it appears to the naked eye. Thus, for example, *Huygens*, on viewing the sword of *orion* with a telescope of twenty three feet, found that to be twelve stars, which to the eye appear to be one only; *Galileo*, in the *pleiades*, found more than forty stars, and in a small part of *orion*, more than four hundred; and *Maria of Rheita*, with a tube made in Holland, found, in the same *orion*, full two thousand stars.

LXIII. By comparing the observations of the ancients with those of the moderns, we find that the latitude of the fixed stars continues constantly the same; but the longitude of all the stars augments equally: it appears therefore that they move from the west to the east, in circles parallel to the ecliptic. *Hipparchus* doubted of this motion, but *Ptolemy*, almost three hundred years after, proved it: he imagined, moreover, that they advanced a degree in a hundred years.

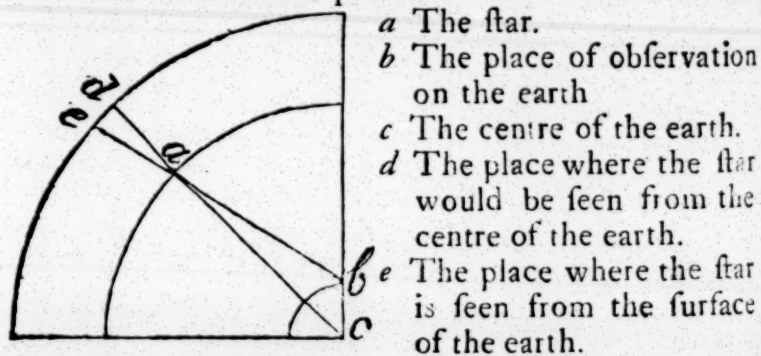
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All succeeding astronomers have endeavoured to determine this motion with more precision; and the result of their observations and calculations has been, that we may justly reckon the progression to be at the rate of a degree in seventy years. By the help of these principles, astronomy shews the manner of finding the longitude of any fixed star for every year, when its longitude for any one year is given; to find the oblique ascension and descension of a star, when its right ascension, its declination, and the elevation of the pole are given; to find, by the ascensional difference of a star, the time it will remain above the horizon; by having the sun's place in the ecliptic, and the right ascension of a star given, to find the time it will pass the meridian; and numberless other like problems, relative to the motion of the stars, and their variable positions in the heavens: problems of the highest utility in improving the art of navigation. By these principles, for example, they are enabled to calculate the day each star will rise or set with the sun; or when they will rise at the time he sets, or set when he rises; which astronomers call *ortus & occasus cosmicus*, and *ortus & occasus acronychus*. When a star rises from out of the rays of the sun, or sets in them, it is called *ortus* or *occasus heliacus*.

LXIV. The light which precedes the rising sun is called the *morning crepuscule* or *twilight*; and that which continues some time after he is set, is called the *evening crepuscule*. We must here make some necessary remarks relative to this matter. As light proceeds in right lines, the sun's rays cannot fall upon our part of the earth after he is under our horizon; but they may affect the air which is higher than the earth. It follows, therefore, that the air throws this light on the earth, either by refraction or from the reflection of his rays by its particles. Experience proves that the sun must be 18 or 19 degrees, according to some authors, or according to M. Cassini 14 degrees, below the horizon, before the evening crepuscule can be over: from whence it follows, that when the difference between the elevation of the

equator and the declination of the sun is not more than 17 or 18 degrees, a small portion of light must be seen above the horizon during the whole night. The air being subject to divers changes, and being sometimes more dense and sometimes more rare, it follows that the twilights cannot be all equal, and consequently we cannot be surpris'd that astronomers differ concerning the degree of depression the sun ought to have to produce them. Astronomy, nevertheless, teaches the method of finding, by having the elevation of the equator given, the duration of the twilight at every part of the globe; or to calculate the same thing, by having the elevation of the pole and the declination of the sun given; and to resolve all other problems relative to the crepuscule.

LXV. When a star is observed from the surface of the earth, it appears in a different part of the heavens than it would do if observed from the centre: the difference between these two places is called its *parallax*; by which term, therefore, is meant the distance between two points where a body appears to be when observed from different places.



It is from this different situation of the observer, and from the refraction of the rays of light, which proceed from a star, and which are so diverted, that they frequently represent it as above the horizon, when it is in fact below it, that are founded the observations which the Dutch made on the other side of Tartary, where, after a night of three months, they saw the sun at mid-day, when he was yet some degrees below the horizon: as likewise the observation of Charles

XI. king of Sweden, when that monarch was, in 1694, at Torneo, where he saw, on the 14th of June, the sun the whole night above the horizon, though the elevation of the pole at that place be but $65^{\circ} 44'$. This difference, and that which is caused by refraction, is of the greatest consequence in astronomy.

LXVI. Hitherto we have endeavoured to give our readers a general idea of *spherical* or *apparent astronomy* (see sect 53.) It now remains that we describe, in as brief a manner as possible, *theoretic astronomy*, and explain the true structure of the universe as it is conceived by the human understanding.

LXVII. When the *sun* rises, the earth is illuminated, and those objects that are opposed to his rays become resplendent, and are diversified with colours; and when we turn our eyes toward that luminous body, they are dazzled with his splendor: but no sooner do the clouds place themselves between the sun and the earth, than the objects lose their lustre, and the sun becomes dim; when he sets, the lustre of all bodies disappears, and the light itself by degrees becomes totally extinct. The sun therefore is the source of light, and is itself a real fire. All astronomers agree in their observations, that there appear spots in the sun, that they are black, that their figures are irregular and variable, as well as their magnitude and duration. It is manifest, that they are near the sun, and perhaps in his body. We have reason to conclude, that they are exhalations, or to use the expression, the clouds of the sun; that he is surrounded by an air or kind of atmosphere; that his body consists of different matters of different kinds, and is subject to various changes. The sun moreover is found to turn round his axis, with his atmosphere, in about 27 days 10 hours: and his figure is nearly that of a true sphere. Some astronomers pretend also to have observed luminous spots in the sun; but these observations are not very well established, and the consequences that can be drawn from thence are not of great importance. Sometimes the sun loses his lustre,

either entirely or in part, in the midst of a bright sky; one would imagine that a black globe came from the east toward the west, and placed itself before him. This is what is called an *eclipse of the sun*; and there is now no doubt but that it is caused by the moon, who in her course happens to be situate between the sun and the earth. It follows, therefore, that the moon is an opake body, which will not suffer the sun's rays to pass through it. When the moon places herself between the sun and the earth during the night, the eclipse cannot be visible to us, but is to those above whose horizon the sun then is: it appears from hence also, that the eclipse which happened at the death of our Saviour, was not a natural one, because the moon was on that day at the full, and consequently 180 degrees distant from the sun.

LXVIII. When we observe the moon near the setting sun, a small part only of her body appears illuminated; and the more she recedes from the sun the greater the enlightened part appears: when she is at 180 degrees distance, that is, at the point of the firmament opposite to the sun, she is at her full, or is entirely illuminated. In proportion as she continues to advance, and to recede from the sun, her light diminishes, and at last, when she nearly approaches him, totally disappears. While she is encreasing, her illumined part is turned toward the west, and toward the east while she is decreasing. It follows therefore, that the part which is turned toward the sun is constantly enlightened. When the moon is quite near the sun, and has scarce any light, we call it the *new moon*; when the half of her body toward the west is illumined, we call it the *first quarter*; when her whole body is enlightened, *the full moon*; and when that half only toward the east is visible, *the last quarter*. Sometimes the moon loses her light, either entirely or in part, when at the full, and it appears, as in the case of the sun, as if some opake body placed itself between the moon and us; and this we call an *eclipse of the moon*; which is occasioned

casioned by the moon's being deprived of her light, when at the full, by the shadow of the earth. It is remarkable, that whereas the eclipses of the sun do not appear equally great, nor begin at the same instant of time in all parts of the earth, those of the moon, on the contrary, are every where equal, and begin and end at the same time; allowance being made for the difference of time under different meridians. The colour of the moon, during the time she is eclipsed, is not always the same, for sometimes she appears red or inflamed. Astronomy assigns the reason of all these appearances, and demonstrates, by the most exact observations, the most certain calculations, and the most just inferences, that the moon, like our earth, is an opaque body, and diversified by mountains, valleys, seas, &c. It even measures the height of these mountains by their shadows. There are also bright spots observed on her surface, and it is manifest that she has an atmosphere, an elastic air, that furnishes rains, dews, &c.

LXIX. After having examined into every thing that relates to these two grand luminaries, astronomy extends its researches to the other celestial bodies: and as the success depends greatly on the instruments that are used for this purpose, every kind of care and industry has been exerted to improve such astronomical instruments as are already known, and to invent new ones. Thus quadrants, telescopes, and other optical instruments, are daily improving, and micrometers are invented and improved; and, by the aid of this very ingenious instrument, are determined the magnitudes of the smallest visible bodies in the heavens, as the apparent length of the shadows of the lunar mountains, their heights, distances, &c.

LXX. By the assistance of these instruments also, astronomy investigates the place, the course, and distance of the planets; and by a consequent calculation, determines the hour and minute when they will be visible to the inhabitants of this earth, or when they will pass over the sun: as for example, the famous transit of Venus over the body of the sun on

the 25th of May 1761, and which was predicted in 1639 by Jeremiah Horroccius, who had observed the like phenomenon: and in a word, all the revolutions that arrive in our planetary world. Venus is called the *morning star*, *phosphorus* or *lucifer*, when she precedes the *sun*; and the *evening star*, or *hesperus*, when she follows him. Mountains and spots are observed on her surface. Mr. Cassini has concluded, by observing their spots, that Jupiter moves round his axis in 9 hours 56 minutes; Mars in 24 hours 40 minutes; and Venus in 24 hours. As there have been hitherto no spots discovered in Saturn or Mercury, nothing can be precisely determined of them relative to this matter.

LXXI. In the year 1609, *Simon Marius* discovered, by repeated observations, that Jupiter was surrounded by four *satellites* or moons, that accompany him in his course round his orbit. Old Cassini discovered, in 1684, that Saturn had five satellites; but none have been observed about the other planets. Saturn sometimes appears to be surrounded by an obscure belt; and seems to have two luminous arms, and these arms divide, and form two *handles*, one on each side; and lastly, the fixed stars may be seen between these handles and the body of the planet. From whence it is concluded, that Saturn is surrounded by a large and thin ring, which is formed by an opaque body, and is every where equally distant from the body of the planet, and moves with it in its course, and is inclined toward the plane of the ecliptic. Saturn, Jupiter, Mars, Venus, and Mercury, are bodies of a similar nature with the moon, as is proved, from their properties, by astronomical reasonings; therefore, as the moon is a body similar to the earth, we may consider the planets as so many terrestrial globes, and conclude that they are not without inhabitants.

LXXII. Jupiter eclipsed Saturn in 1563; Mars eclipsed Jupiter in 1591; Venus eclipsed Mars in 1590, and Mercury in 1599; the moon eclipsed Venus in 1529; and Mars and Jupiter have eclipsed the

the fixed stars. It follows that when these bodies eclipse and hide each other from the inhabitants of the earth, Saturn must have been further distant than Jupiter, Jupiter more distant than Mars, he more distant than Venus, Venus more distant than the moon, and the fixed stars more distant than Jupiter and Mars, from the earth. Astronomy, after teaching to measure the apparent diameters of the planets, proves that these diameters are not always the same; and concludes from thence, that the planets are not always equally distant from the earth: It shows also the method by which the longitude and latitude of the planets are determined, and every thing that relates to their courses, and that can serve to explain the phenomena that arise from them.

LXXIII. By the aid of these principles, astronomy overthrows the system of Tycho Brahe, who imagined that the earth remained immoveable in the centre of the universe, and that the sun, the moon, and the other planets, as well as the fixed stars, turned round the earth in 24 hours at different distances, and with velocities more or less rapid. All observations, all experiments, calculations, and reasonings, the most simple as well as the most abstract, furnish a thousand arguments to prove the fallacy of this hypothesis, and to establish, at the same time, the true and obvious system of Nicolas Copernicus, who asserted, and is supported in the assertion by all the most eminent modern philosophers and astronomers, " That the sun is placed nearly the centre of our
 " planetary world, and that it moves only about its
 " axis: that Mercury, Venus, and the earth, move
 " round the sun; the last in the space of a year:
 " that the earth and planets revolve round their axis:
 " that Mars at a greater distance, and Jupiter and
 " Saturn at distances still greater, move round the
 " sun, and at the same time round the earth: that
 " the fixed stars remain immoveable in the firmament,
 " at an immense distance, unless, as is most probable, they turn round their axis: that the moon
 " moves round the earth in 27 days, and, with the
 " earth,

“ earth, about the sun in a year ; as do the satellites
 “ of Jupiter and Saturn, round those planets, and
 “ with them in their courses.” All observations and
 experiments that have been made from the time of
 Copernicus, and those which are every day making,
 unanimously coincide in confirming this theory ; and
 it is even surprising with how much precision they
 confirm it, and in how minute a manner they prove it
 to be the true system of the universe.

LXXIV. By this system, astronomy teaches also the
 method of observing the sun's entrance into the equa-
 tor, or the *equinoxes* ; his entrance into the signs of
 cancer and capricorn, or the *solstices* ; to determine
 the length of the *solar year*, that is, the time he takes
 in passing through the whole ecliptic. It proves,
 likewise, that the earth and other primary planets, in
 their courses round the sun, do not describe eccentric
 circles but ellipses ; and explains, at the same time,
 the effects of these motions.

LXXV. There are certain terms that astronomy
 makes use of in describing the celestial motions which
 are peculiar to this science, and which it is quite
 proper here briefly to explain. By the term *periheli-*
on, is meant that point of a planet's orb where it is
 nearest the sun ; and by *aphelion*, that point where it
 is furthest distant from it. The line, drawn from the
 perihelion to the aphelion, is called *linea absidum*.
 The distance between the focus where the sun is
 placed, and the centre of the earth's orbit, is called
 its *eccentricity*. The line drawn from the centre of
 the sun, to the circumference of the ecliptic orb of a
 planet, is called its *distance* or *interval*. The *mean*
anomaly is the time a planet takes up in passing from
 the point of its aphelion to a given point in its ellip-
 sis. The *mean motion* of a planet is that in which it
 describes equal distances in equal times. The *true*
motion, on the contrary, is that which a planet ap-
 pears to have when seen from the earth. An *eccen-*
tric circle is that which is described by half its axis
 through the aphelion and perihelion. The *eccentric*
anomaly is an arch of the eccentric circle. The *equal*
anomaly

anomaly is the angle under which the arch is seen from the sun, between the aphelion and perihelion. The *equation*, or *prosthaphæresis*, is the difference between the mean and equal anomaly. The *nodes* (nodi) are the two points where the orbit of a planet cuts the ecliptic. The *inclination* is the arch of a circle drawn from the sun, and passing through the planet and ecliptic, forms a right angle with the sun. The *argument of inclination* is the extended arch of the planet's orb. The *eccentric place* of a planet is the point of its extended orbit from whence it is seen from the sun. The *reduction of the ecliptic* is the difference between the eccentric longitude, and the argument of inclination. The *contracted distance* of a planet is the line contained between the centre of the sun, and another line drawn perpendicularly from the planet to the plane of the ecliptic. The *heliocentric place* of a planet is that point of the ecliptic, where the planet is seen from the sun, and the *geocentric place* is that point where it is seen from the earth. The *angle of commutation* is the difference between the true place of the sun, where it is seen from the earth, and the place of the planet when reduced to the ecliptic. The *angle of elongation* is the difference between the true place of a planet and where it is seen from the earth. The *parallax of the earth's orbit* is the difference between the angle of commutation and that of elongation. The *latitude* of a planet is its distance from the ecliptic when seen from the earth.

LXXVI. The *apogee* is that point of the heavens where the moon, or any other planet, is at its greatest distance from the earth; and the *perigee* is, on the contrary, that point in which it is nearest to the earth. After astronomy has explained all these terms, and shown, by the celestial globe, their exact signification, it has recourse to its principles to show, and even to calculate, all the different phases or appearances, and all the irregularities in the course of the moon and other planets, and the distance of the sun from the moon, the earth, &c. to determine the true latitude

latitude of the moon and the rest of the planets, and the stations and dimensions of the heavenly bodies : in a word, to account for all the various phenomena that are visible in the vast expanse of heaven.

LXXVII. The most accurate observers, on viewing the *fixed stars* through the best telescopes, can discern nothing more than luminous points, without any apparent magnitude. They cannot therefore be distinguished by their figures, but by the degrees of their lustre, and there are no foundations on which to determine their distances with any sort of precision. They cannot derive their light from the sun, seeing they are farther distant from him than Saturn, and their splendor is nevertheless far greater. It is therefore to be supposed, that they shine by their own proper light, that they are so many suns, and are each of them surrounded by revolving planets. There have also appeared, at different periods, new stars, that have shone for a time, have by degrees diminished, at last have totally disappeared, and have been seen no more. We likewise see, at different times, *comets* with long streams of light, that are called *tails* : the courses of these are not confined to the planetary zodiac, but sometimes go from south to north. Their directions, however, are regulated by a zodiac that is peculiar to themselves, and which M. Cassini has included in these lines :

Antinous, pegasusque, andromeda, taurus, orion,
Procyon atque hydrus, centaurus, scorpius, arcus.

Astronomy explains all the theory of comets, as far as it is hitherto discovered, and describes the most exact and distinguished observations, that have been made on these bodies.

LXXVIII. The *aspect* of the stars and planets is their situation in the zodiac, with regard to the sun and each other. There are properly four aspects : the *sextile*, when they are at 60 degrees distance from each other : the *quartile*, at 90 degrees : the *trine*, at 120 degrees : and the *opposition*, at 180 degrees.
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The conjunction is when they are seen together, or in the same degree. When $\hbar$ and $\mathcal{U}$ enter the first point of aries at the same time, which happens but once in 794 years, it is called the grand conjunction. To conclude, astronomy lays down infallible rules for calculating eclipses of the sun and moon, whether they be total, central, or partial; and to determine, with the greatest precision, their appearances, their immersions and durations. It describes also the method of observing them with the greatest exactitude, and points out all the useful inferences that may be drawn from these observations. The particulars relative to these calculations would carry us beyond our bounds, and must be learned by the study of the science itself. We shall therefore finish this article, which may appear to some readers perhaps already too long, with a *table of the distances* of the sun and planets from our earth, in the numbers of its semidiameters, according to M. Cassini.

Greatest distance.			Mean distance.			Least distance.		
$\hbar$	—	244000	—	210000	—	176000		
$\mathcal{U}$	—	143000	—	115000	—	87000		
δ	—	59000	—	33500	—	8000		
$\odot$	—	22374	—	22000	—	21626		
φ	—	38000	—	22000	—	6000		
$\S$	—	33000	—	22000	—	11000		
$\mathcal{D}$	—	61	—	57	—	53		

Now the semidiameter of the earth being, as we shall presently shew, equal to 3968 miles, it is only necessary to multiply each distance by that number, in order to find its exact distance in miles; and the knowledge of these distances is of the greatest utility in astronomy, in the investigation of the true celestial system, and, in particular, the construction of our planetary world.

LXXIX. (15) MATHEMATICAL GEOGRAPHY is the science of the figure and magnitude of the earth, and of its properties which result therefrom.

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The figure of the earth is nearly that of a regular globe, as is manifest from its shadow on the moon in an eclipse. We say *nearly* regular, because Newton, Maupertuis, Condamine, and other modern mathematicians, have proved that the earth is somewhat oblate or flattened at the poles. But as, according to the most accurate observations, the greatest diameter of the earth is to the least but as 578 to 577, this depression of $\frac{1}{578}$ of its diameter is an imperceptible quantity, and we may consider the earth, in practical geography, as a perfect sphere. The circuit of this globe has been made several times by sea, and the least time that has been taken up in that navigation, is 802 days. From this orbicular figure of the earth it follows, 1. That the sun cannot rise or set at the same time in all parts: 2. That travellers must see the points of steeples, and the summit of mountains, sooner than objects that are nearer to the earth: 3. That there must be antipodes, who have the heavens above their heads, and the earth under their feet, as we have.

LXXX. The two points, round which the earth turns, are called its *poles*. The equator, ecliptic, tropics, meridian, horizon, &c. are the same on the terrestrial globe, as on the celestial, and have the same properties; which we have explained under the article of astronomy. With regard to the meridian, however, it is necessary to observe, that there are as many meridians on the earth, as there are points in the equator. All geographers do not fix the first meridian, from whence they reckon the longitude, at the same point. Some place it at the island of Teneriff, one of the Canaries; others at the island of Feu; others at the island of St. Nicholas near Cape Verd; others at the islands del Corvo and Flores; others at the isle of Palms; and the French, by order of Lewis XIII. at the island of Fero. Mathematical geography teaches to find, by the aid of trigonometry, the space between two places at a great distance from each other, and from thence the dimension of the earth's diameter, which it has fixed at 7866 miles; and

and a degree on its surface at 69 miles, 288 yards : from whence its whole circumference must be 24, 899 miles ; its whole surface 171 millions of miles ; and its solid content 30,000,000,000,000 000, millions of cubic feet. Geography teaches likewise to measure, by the same means, the length of a degree in any given latitude from the equator ; to know to what distance the sight can extend from the summit of a mountain, &c.

LXXXI. By the *latitude* of a place, is meant its distance from the equator toward the pole, and this is equal to the elevation of the pole. The *longitude* of a place is an arch of the equator, contained between the first meridian and the meridian of that place. Geography teaches the methods of finding the longitude and latitude. The countries, included between the two polar circles, are called the frigid zones (*zonæ frigidaë*) ; those between the polar circles and the tropics, *temperate zones* ; and those between the two tropics, the burning or *torrid zones*. They who live under the tropics have the sun, once in the year, directly over their heads ; they who inhabit the torrid zones, twice ; but all beyond the tropics never have the sun directly over them, as he never passes those bounds. When the sun approaches nearest to our zenith, it is *summer* ; when he is farthest distant from it, it is *winter* ; when after the winter he enters the equator, it is *spring* ; and when he enters it again after the summer, it is *autumn*. When the sun is in the equator, that is, at the *equinoxes*, the day and night are equal over the whole globe. Under the equator, the days and nights are equal during the whole year. They, who live under the line or equator, are said to live in a *right sphere* (*sphæra recta*) because the sun and stars rise on them in right lines. Under the poles, it is six months day and six months night ; and the inhabitants of that country are said to be in a *parallel sphere*, because the sun and stars move round them in circles parallel to their horizon. The greater the elevation of the pole is at any place, the longer is its longest day, and the shorter its shortest night.

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night. They who inhabit these countries where the pole is elevated above the horizon, are said to live in an *oblique sphere*, because the sun and stars rise obliquely on their horizon.

LXXXII. The surface of the earth is divided, by circles parallel to the equator, into *climates*: that is, a parallel circle is drawn through every degree of latitude where the longest day is augmented by half an hour. Geography teaches likewise to find the latitude or elevation of the pole at any place, by knowing the length of its longest day. If we sail round the earth from west to east, on our return we shall find that we have gained a day: but if we make the same voyage from east to west we shall at our return have lost a day. If a line be drawn from the eye parallel to the horizon, to a point in the celestial sphere, that point is called the *rhumb* or point of the compass. Geography explains the method of making, according to these principles, terrestrial globes and maps, universal and particular; to find by the aid of calculation the distances of places, by knowing their longitudes and latitudes, and to mark them with precision on these globes and maps; and to resolve all sorts of problems that relate to the construction, division, and configuration of the terrestrial globe. All these operations are founded however, for the most part, on the principles of astronomy and trigonometry, as well plain as spherical.

LXXXIII. (16) The ART OF NAVIGATION, which by some is denominated *nautical geography*, is founded principally on astronomy and mathematical geography. It is the art of conducting a ship through the various parts of the vast ocean, by the inspection of the sun and of the stars. Mathematicians, who treat on it as a separate science, call it *hydrography*, and explain in full detail the figure and magnitude of the earth, the longitude and latitude of places, and their distances; the zones, the season of the year, the climates, and the enlightened and dark parts of the globe. They treat moreover of the antoeci, the perioeci, and antipodes; of the points of the compass.

pass, of the trade winds and those that are variable ; of the manner of making globes and marine charts ; of *hydrographics*, or the description of the watery parts of the globe ; of the mariner's compass, of *loxodromy*, or the course of a vessel ; of the manner of reckoning a voyage, and of finding the longitude and latitude at sea ; of plain, Mercator's, and circular navigation, &c. But as most of these matters make part of other mathematical sciences, and have been extracted from them for the use of mariners and pilots, we shall not enter into a particular inquiry concerning them in this place. M. Wolff has treated of them at large in his *Mathematical Elements* in Latin ; M. John Bernoulli has given, in the second part of his works, a new theory of the method of working a ship ; M. Maupertuis has wrote a nautical geography ; the celebrated M. Euler has likewise just published a new theory of the manœuvre of ships ; and there are an infinite number of works of this kind in English and Dutch, which are enriched with all the necessary tables for facilitating and abridging the laborious calculations of navigators.

LXXXIV. We shall only remark here, that the first object of a navigator should be to acquire a perfect knowledge of the compass and its use : in order to which, we must observe, that the rhumb (see sect. 82.) on which we see the sun at mid-day, is called the *south*, and that point, which is directly opposite to it, the *north* ; when we turn our face toward the north, we have, at 90 degrees distance on the right hand, the point of *east*, and at the same distance on the left, the *west* point. These four principal rhumbs are called the *cardinal points*. Between these are four middle points, which take their names from the cardinal points that are next to them, the north and south points being named first : they are therefore called *north-east*, *north-west*, *south-east*, and *south-west*. The parts between these are likewise divided in the middle by eight other points, which take, in like manner, their names from the points on each side of them, still observing to name the cardinal

nal points first, as *south-south east, east-south-east, east-north-east, north-north-east, north-north-west, west-north-west, west-south-west and south-south west*. The arcs between these 16 points are again divided into equal parts, and are called *north by east, north by west, north-west by north, &c.* These 32 points are marked with particular care on the compass, and as the needle when poised on its centre turns always towards the north, whatever course the ship takes, it is easy to see on what point it steers, and to what point it ought to be directed.

LXXXV. The other principal object of inquiry should be the method of determining the longitude and latitude of the place where a vessel at any time is. Astronomy teaches several ways of finding these. With regard to the latitude, as it is equal to the elevation of the pole, there can be no difficulty in finding that: but as, in order to determine the longitude, it is necessary to know the difference in time between the first meridian and the place where the ship then is, or between that where it then is and some other place whose longitude is known, the operation by sea is attended with great difficulties. The most simple method is, to be provided with a very correct watch; and to regulate it by the meridian of the place where we embark, and to find at another place, by the altitude of the sun in the day, or by the stars at night; the hour at the place we then are. By which mean we find the difference of time between the place where we are, and that from whence we set out; and by knowing the longitude of that place, we readily find that of the place where we then are. Now, this knowledge is highly expedient for navigators, as by knowing the longitude and latitude of a place, they can precisely determine on what part of the globe they then are. But as no clock or watch, of common construction, can preserve the true time by sea, and consequently cannot be sufficiently depended on in long voyages, the commercial nations have destined large rewards for those who shall discover a certain method of determining the true longitude of any place

place at any time: and though this method has not yet been discovered, we ought not however to despair of it*. We frequently see men, allured by the reward, attempt this discovery, though they are in a manner ignorant of the mathematics, and consequently do not understand the nature of the inquiry: and others who treat it as a chimera, and rank it with the philosopher's stone and perpetual motion; both equally absurd.

LXXXVI. (17) GNOMONICS, or the art of constructing sun-dials, is the last of the mathematical sciences. A sun-dial is a plane, whereon are described certain lines, on which the shadow of a gnomon or hand falling shews, successively, the several hours of the day. It follows therefore, 1. That a solar dial can only shew the hour of the day while the sun's rays fall on it: 2. The sun, as long as he is above the horizon, shines on a plane that is parallel to it, and consequently a dial, drawn on such a plane, must shew the time during the whole day: 3. A plane that is turned toward the east, on the contrary, can only shew the hours before noon; and one turned toward the west, the hours after noon: 4. If a plane be turned toward the south, and is so placed as to make with the plane of the horizon an angle that is equal to the elevation of the equator, it is consequently in the plane of the equator. The sun therefore can fall on the upper part of it only, when he is above the equator, near to us in the northern signs; and on the lower part only when he is in the southern signs. Such a dial, therefore, can shew the hour by its upper part only in spring and summer, and by its lower part in autumn and winter; but each of them shew the time in those seasons, during the whole day. 5. A plane, turned towards the north in such manner that it forms with the horizon an angle equal to the elevation of the pole, is in the plane of the sixth ho-

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* It should seem, that when our author wrote this part of his book, the reputation of Mr. Harrison's watches had not come to his knowledge.

rary circle, and consequently cannot be enlightened on the upper part, till after six in the morning, nor later than six in the evening; and on the lower part, not after six in the morning, nor till after six in the evening.

LXXXVII. By these principles, and those of astronomy, on which the gnomonical art is founded, we are taught to construct an instrument by which we may find the declination of a verticle plane from south to north, as well as the horizontal plane. It then distinguishes, 1. The *equinoctial dial*, which is drawn on a plane that forms an angle with the horizon equal to the elevation of the equator. 2. The *horizontal dial*, which is described on a horizontal plane. 3. The *vertical dial*, drawn on vertical planes. If the plane on which it is drawn looks toward the south, it is called a *south dial*, and a *north dial* when it looks toward the north; and if its surfaces decline, it is also called a *declining dial*. 4. Dials, directed toward the east or west, are in like manner called *east or west dials*. 5. *Polar dials* are those that are drawn on a plane that has such an inclination toward the north, as to make an angle with the horizon, that is equal to the elevation of the pole. Those planes that make, with the plane of the horizon, angles that are neither equal to the elevation of the pole, or that of the equator, are called *inclining dials*; and if the planes decline at the same time toward the north or south, they are called *declining dials*. Gnomonics therefore teaches the method of describing all the different kinds of dials, by the aid of astronomy, the principles of mathematical geography, and trigonometry: and, as it has no influence on the other sciences, we shall content ourselves with having mentioned, in this place, the principles on which it is founded, and the aids of which it makes use.

LXXXVIII. Thus, we think we have traced the outlines of the seventeen sciences that we comprise under the denomination of Mathematics: and as we do not propose in this work fully to instruct our read-

ers in the sciences themselves, but merely give a general idea of them, to describe the parts of which they consist, and to explain the method by which a just knowledge of them may be attained, we believe that in what is here given we have fulfilled our design. Civil architecture and chronology we have referred to the other volumes, to which they appear more properly to belong; where, however, we shall take care to show in what manner they relate to the mathematics. We have been obliged to be more explicit, more prolix, and perhaps more tedious, than we intended, and could have wished: and have sometimes found ourselves under the necessity of giving definitions and descriptions of principles that are known to every one, even to children. But it is thus that the mathematics proceeds in its most sublime inquiries. It is thus that the truth is to be discovered in the greatest objects, as well as in the least: for it is not by the ornaments of a florid and pompous style, that demonstrations are to be established. We shall conclude this article with observing, that the authors who have wrote on the mathematics in general, and on each of its branches in particular, are innumerable. M. Wolff has given at the end of the fourth volume of his Elements, a methodical catalogue of a great number of them, which forms a complete treatise, and may be consulted occasionally to very good purpose. They, who want to be instructed in its technical terms only, may have recourse to the Dictionary of M. Ozanam, which is known to every one.

BOOK THE SECOND.

O N

THOSE SCIENCES THAT PROCEED FROM
THE IMAGINATION.

C H A P. I.

OF THE POLITE ARTS IN GENERAL.

I. **T**HE effence of that part of erudition, which we comprehend under the denomination of polite arts, consists in *expression*. The end of all these arts is *pleasure*; whereas the end of the sciences is *instruction* and *utility*. Some of the polite arts indeed, as eloquence, poetry, and architecture, are frequently applied to objects that are useful, or exercised in matters that are instructive, as we shall show more particularly in their proper place; but in these cases, though the ground-work belongs to those sciences which employ the understanding, yet the expression arises from the inventive faculty. It is a picture that is designed by Minerva, to which the muses add the colouring, and the graces the frame. This union forms therefore the perfection of the art, according to that sententious and well known precept of Horace,

Omne tulit punctum, qui miscuit utile dulci.

II. All the arts in general are divided into *mechanic* or *useful* and *liberal* or *polite arts*. Without entering

tering here into a critical inquiry whether this division be just, and strictly conformable to the etymology of the words; without examining if the useful arts do not require the assistance of the sciences, and oftentimes even the polite arts; and if, in return, some of the polite arts do not want the aid of mechanics, and of the useful arts, we shall content ourselves with adopting this division established by custom; and the rather, as the useful arts, such as masonry and carpentry, baking and brewing, and a thousand others, where, with the aid of common sense, they labour more with the body than the mind, do not directly appertain to erudition; and it would be only making useless divisions, and perplexing our ideas, to confound these with the liberal arts, which, being the produce of the imagination, belong so essentially to literature.

III. The reader therefore is not to expect to find, in this book, instructions relative to the mechanic professions, as we shall confine our inquiries entirely to the polite arts in general. Under this denomination we comprehend, 1. Eloquence: 2. Poetry: 3. Music: 4. Painting: 5. Sculpture: 6. Graving: 7. Architecture: 8. Declamation: 9. Dancing. We propose to give a particular description of each of these arts; but as it is impossible to excel in oratory or poetry, without a perfect knowledge of the language in which we speak or write, without knowing the rules by which we are taught to express ourselves *correctly* and *happily*, we shall introduce the analysis of the polite arts by that of *grammar* and *rhetoric*; and the rather, as we know of no place more proper to treat on these sciences; for though in fact they more strictly relate to the memory and judgment than to the invention, yet they are, at the same time, so intimately connected with eloquence and poetry, as to become a necessary introduction to the polite arts. To be a good painter, we must begin by learning to design; and to excel in the arts of speaking and writing, the knowledge of grammar and rhetoric is indispensable.

IV. There is one very essential reflection, which it appears to us proper to make in this place, on the polite arts in general. All the rules in the world are not sufficient to make a great poet, an able orator, or an excellent artist; because the quality, necessary to form these, depends on the natural disposition, the fire of genius, which no human art can confer; but which is the pure gift of heaven. The rules, however, will prevent a man from being a bad artist, a dull orator, or a wretched poet; seeing they are the reflections of the greatest masters in those arts; and that they point out the rocks which the artist should shun in the exercise of his talents. They are of use, moreover, in facilitating his labours, and in directing him to arrive, by the shortest and surest road, to perfection. They refine, strengthen, and confirm his taste. Nature, abandoned to herself, has constantly something wild and savage. Art, founded on just and sagacious rules, gives her elegance, dignity, and politeness; and it is impossible to sacrifice properly to the graces, without knowing the incense that is pleasing to them.

V. *Beauty* is the object of all the polite arts. It is not however so easy, as it may seem, to give a clear and determinate idea of what we precisely mean by that term. Many able writers, who have treated expressly on the subject, have shewn that they were totally ignorant of what it was. It is one of those expressions that we comprehend immediately, that present us with a clear and precise idea, that leave a distinct impression on our minds, when it is simply wrote or pronounced; but which philosophers envelope in darkness, when they attempt to elucidate it by definitions and descriptions; and the more, as mankind have different ideas of beauty, their opinions and tastes being as various as their understandings and physiognomies. We may say, however, in general, that beauty results from the various perfections of which any object is susceptible, and which it actually possesses; and that the perfections which produce beauty consist principally in the agreeable and delightful

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ful proportions which are found, 1. Between the several parts of the same object, 2. Between each part and the whole together, 3. Between the parts and the end or design of the object to which they belong. *Genius*, or invention, is that faculty of the mind by which *beauty* is produced. *Taste*, disposition, or rather the natural sensation of the mind refined by art, serves to guide the genius in discerning, embracing, and producing that which is beautiful of every kind. From whence it follows, that the general theory of the polite arts is nothing more, than the knowledge of what they contain that is truly beautiful and agreeable; and it is this knowledge, this theory, which modern philosophers call by the Latin name of *æsthetica*.

VI. It should be constantly remembered, that we have said in the first section, that the essence of the polite arts consists in expression. This expression lies sometimes in the words, and sometimes in the pen; sometimes in their sounds and their harmony, and at others, in corporeal attitudes; sometimes in the pencil, or in the chisel, and at others, in the graver; sometimes in a proper disposition or judicious employment of the mechanic arts, and at others, merely in their manner of acting. From whence arise those arts that we have mentioned in the third section, and that we shall describe in the following chapters.

VII. The general theory of the polite arts, or *æsthetics*, necessarily supposes, therefore, certain rules; but these general rules are of no great number. The first is, that whoever would devote himself to the polite arts, should above all things *consult his genius*; divest himself of all self-love; and examine if he be a true son of Apollo, and cherished by the muses: for

C'est en vain qu'au Parnasse un téméraire auteur,
Pense de l'art des vers, atteindre la hauteur,
S'il ne sent point du ciel l'influence secrète,
Si son astre en naissant, ne l'a formé poète.

In vain, rash author, dost thou strive to climb,
 By lofty verse, Parnassus' height sublime,
 If heaven does not by secret powers inspire,
 Or if thy natal star darts not poetic fire.

This first precept, which the sage Despreaux here gives with regard to poetry in particular, is applicable to all the polite arts in general; for their most happy success is founded on *imagination*. By this term we understand, in general, a faculty of the mind, a particular genius, a lively invention, a certain subtle spirit, which gives a facility in discovering something new. But it is necessary also to prescribe just bounds to this term *new*, which must not be here taken in an absolute sense. Solomon wisely remarks, that, even in his time, *there was nothing new under the sun*. In fact, all that exists, and all that is capable of being discovered in the known world, has already been discovered. The fine arts in their imitations of nature, in their expressions, can borrow images, figures, comparisons, from those things only that exist and are known. As there have been, from the beginning of the world to our days, millions of authors in each of the polite arts, almost all the possible combinations of the various subjects have been produced by their lively imaginations; and when we hear the ignorant part of mankind talk of a work of wit, or of art, *that is entirely new*, that offers ideas which were before utterly unknown, that had never entered into the brain of any other man, we should refer such assertions to the class of popular errors; and reflect on those stories we every day hear of certain empirics, who pretend to be alone possessed of marvellous methods of cure by means of *simples*; as if there were any plant, any stalk of grass that grows in our world, that can have escaped the researches of botanists. But the novelty, of which we here speak, consists in the ingenious use of combinations of all the various objects of nature, that are new, happy, and agreeable, that have not yet been exhausted,
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and which even appear to be inexhaustible ; and of the use which the artist makes of all new discoveries, which he turns to his advantage, by a judicious application. Invention therefore supposes a considerable fund of preliminary knowledge, such as is capable of furnishing ideas and images, to form new combinations. But there is no art by which invention itself can be produced ; for that, as we have already said, is the gift of heaven ; and it is an endowment which we cannot even make use of whenever we please. We shall have occasion to exemplify these ideas in discoursing on the arts themselves.

VIII. We would rather say, therefore, that invention consists in producing, in works of genius, *that which is unexpected* ; an object, a harmony, a perfection, a thought, an expression, of which we had no idea, that we could not foresee, nor hope to find, where the artist has so happily placed it, and where we perceive it with delight. This idea appears to me applicable to such of the polite arts as affect the mind by hearing as well as by the sight ; and it is a matter that is highly essential.

IX. The second rule is, that every artist ought incessantly to labour, during the whole course of his life, in the improvement of his *taste* ; in acquiring that sensible, refined, and clear discernment, by which he will be enabled to distinguish the real beauties in each object, the ornaments that are agreeable to it, and the proportions and relations that subsist among the several parts : and by this faculty, he will be regulated in the employment of his natural talents. This labour consists not only in the profound reflections he will make on the properties of objects as they relate to the fine arts, but also in a constant, assiduous study of the grand models of beauty.

X. The third rule, to be observed in the practice of the polite arts, is *the imitation of nature*. The celebrated Bartheux has so fully and so ingeniously explained this rule, that we shall refer the reader to his excellent work on this subject ; and in adopting his principles, we shall only add, that every object in the

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universe has its peculiar nature, of which the artist should never lose sight in his manner of treating it. In vain will he otherwise ornament his work with the most refined and most brilliant strokes; for, if nature be not justly imitated, it will for ever remain imperfect. The sublime Homer has sometimes sinned against this rule: for, as the Gods have a nature peculiar to themselves, it cannot be a just imitation when we attribute to them passions that are scarce pardonable in mortals, and make them frequently converse in a language that is at once vulgar and ridiculous. It was not to imitate nature, to put into the mouth of a hero, at the moment of a decisive battle, an harangue that must become tedious by its excessive length, and which certainly could not have been heard by the thousandth part of a numerous army; without mentioning a hundred other like faults that are strewed over the poems of that great man. We must however inform all artists, that this imitation of nature, which appears at first view so simple and so easy, is of all things the most difficult in practice; and that it requires a discernment so sagacious, and an expression so happy, as is rarely bestowed by heaven on mortal man, as we shall more fully explain in treating on each separate science.

XI. *Perspicuity* forms the fourth rule of expression. In all the fine arts, in general, an obscure, perplexed, ambiguous; and elaborate expression is always bad. The true, striking beauty must be manifest, and perceptible to the most ignorant of mankind as well as the most learned. Those are ever false or inferior beauties that have occasion for a covering, a kind of veil that may make them appear greater than they really are: true beauty wants no veil, but shines by its native lustre. From the union of the true imitation of nature with perspicuity of expression, arises that *truth* which is so essential in the productions of the fine arts.

XII. In all the polite arts, and in all the subjects they embrace, there must necessarily reign an elevation of sentiment, that expresses each object in the
greatest

greatest perfection of which it is susceptible: that imitates nature in her most exalted beauty. This makes the fifth general rule. The design of the fine arts being to excite pleasure by the expression of that which is beautiful, every artist should raise himself above his subject, and choosing the most favourable light wherein to place it, should there embellish it with the greatest, most noble and beautiful ornaments, that his own genius can suggest: still, however, observing a strict imitation of nature.

XIII. From the observation of these two last rules results the *sublime*, which is the union of the greatest perspicuity with the strictest truth and most exalted elevation possible. It is necessary to remark here, that the most simple and common subjects are susceptible of a sublime that is agreeable to their nature. An idyl or a landscape may be as sublime in their kinds, as an epic poem or a history piece. When Moses begins the book of Genesis with these words, *In the beginning God created the heaven and the earth*; or when he tells us, that God said, *Let there be light and there was light*; these expressions are sublime in the highest degree, because they are perfectly clear, true, and elevated. Every author should therefore endeavour after the sublime in every subject that he undertakes: and this makes the sixth and last general rule in the practice of the polite arts. But if he cannot attain to this, it is, however, indispensably necessary, that he constantly make use of expressions that are *noble* and *refined*. Every thing that is *low*, *indecent*, or *disagreeable*, is naturally repugnant to the sublime, and ought to be for ever banished from all works that proceed from the noble and liberal arts.

XIV. We desire the reader will constantly remember the general principles we have here established for the polite arts, in the analysis we shall now make of the particular rules relative to each art; the brief explanations of which may serve to conduct the disciples of the Muses to a successful practice. But before we finish this introduction, it seems necessary to remind our readers of a maxim drawn from nature and experience,

rience, and which Mr. Rollin has so well expressed in his treatise on study, that we shall here make use of his words: "The precepts of arts and sciences, says he, founded on the principles of good sense and right reason, are nothing more than judicious observations made by men of ability on the productions of the best authors, which have been afterwards reduced into order, and united under certain heads; as for example, with regard to rhetoric, on the discourses of the most celebrated orators; which has given occasion to say, that eloquence did not arise from the art, but the art from eloquence."

XV. We borrow with pleasure this just reflection of Mr. Rollin, and we desire he may have the reputation of it. His book, *on the method of teaching and studying the belles lettres*, is a work dictated by the most noble of all motives, the love of mankind: it is the work of an honest man, of a virtuous citizen who aspires to be truly useful: but we must caution the young student, not to take this book but for what it really is, and to use it with circumspection. It is not a systematic work. The limits of the belles lettres are not there exactly marked; all the sciences are there confounded; there are very few definitions, and those few are imperfect; the axioms, the principles, the fundamental rules that flow from them are not marked with precision; the terms of art not sufficiently explained; theology, philosophy, morality, and many other sciences that have no relation to the belles lettres, are there mixed with them. From all this arises a confusion in the mind that is very detrimental to those who devote themselves to study. We ought therefore to regard this singular work, not so much as a dogmatic treatise on the belles lettres, as an ingenious compilation of the most pleasing examples drawn from the best authors; executed with taste, and ornamented with the graces of style.

C H A P.

C H A P. II.

GRAMMAR.

I. **I**N treating on the polite arts, and among the rest, on eloquence and poetry, it appears to us natural to begin with grammar and rhetoric; for though these in fact belong to the memory and judgment, yet they serve as guides to conduct us in the career of refinement, and to introduce us to the sanctuary of genius. We do not propose to mount to the top of the tower of Babel, and there to search for the original of languages: for there now remains of that famous epoch neither monument nor vestige, nor the least shadow of grammar of the languages that were then confounded; or of that which resulted from that confusion. Leaving, therefore, this inquiry entirely to the antiquaries, as it would moreover be of no utility to our design, we shall content ourselves with making here some reflections, drawn simply from the light of reason.

II. Every being, that is endowed by the Creator with any faculty whatever, is born with a desire (which is called *instinct*) to exert that faculty. So the bird flies, the hind runs, and the fish swims, when they have it in their power. The first men, doubtless, made use of articulate sounds to express their wants, as they found themselves possessed of that faculty; but they did not in fact speak, they did not form any language, because they had not agreed tacitly and by habit, that such and such sounds, whether simple or compound, should signify such and such things. In proportion as knowledge and wants increased among men, the sounds, the words, and expressions that were to denote those wants, increased likewise. They began by uniting simple ideas, by ranging those ideas, and by rendering them sensible to others, in a formal language; and lastly, they invented the method of expressing their words by characters,, and by that means made them distinguishable

by the eye. Such was the rise of speech and writing. All this was improved by degrees, and is still daily improving. But as mankind were soon dispersed over the earth, without having much communication with each other, especially in the first ages of the world, when they were even prevented by the deserts and rivers which separated them from each other, the signification of sounds became arbitrary among different people; and, in proportion as knowledge and wants increased among one particular people, they invented new words whereby to express them. Such was the natural origin of the diversity of languages; and it was physically and morally impossible that it could have happened otherwise.

III. It is not our design, moreover, to make inquiry here into the organs of the voice, and the manner in which words are formed by the throat and by the mouth. We shall leave the investigation of this to the philosophers and anatomists. It is sufficient for us to know, that we have the faculties of speaking and writing, that there are in the world languages which are determinate and subject to certain principles and rules, and that the knowledge of these principles and rules now forms a particular science, which is called grammar, and of which we now propose to treat. We shall only just mention here, that languages are distinguished into *dead* and *living*. The former are such as were anciently spoke by nations that now no longer exist: and as the elements of sciences have come down to us from those people, who cultivated them with these languages, they are likewise called *learned languages*; while those, of which modern nations make use in the ordinary commerce of life, are called *vulgar languages*. It is evident, the former can now undergo no alteration, whereas the latter are subject to continual changes. We shall explain this matter more fully in the chapter on philology, whose place is in the third book, among the sciences that employ the memory.

IV. Grammar is not, as most authors have defined it, *the art of speaking well*, for that more properly belongs to rhetoric; but it is, *the art of speaking and writing*

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writing a language CORRECTLY. This art is divided into three parts. The first teaches the true pronunciation, and the correct orthography: the second treats of the nature of words: and the third gives the rules for their proper arrangement, which is called *syntax*, that is, the guide for construction. To express his thoughts, man makes use of the voice, writing, or action. In the first case, he employs articulate sounds, that are called *words*; in the second, written characters, which imply those words; and in the third, all sorts of signs and motions of the body and its members, to express a word or a thought; so, for *yes*, or an assent, we incline the head, and for *no*, or a dissent, we shake the head; and in short, all the gestures that pantomimes have invented are here used. Words are composed of letters and syllables. There are in the French alphabet twenty-four letters*, which are divided into vowels and consonants. A *vowel* is a letter that forms a sound of itself, as a, e, i, o, u. A *consonant* is a letter that cannot be pronounced without a vowel, as b, c, d, &c. A *diphthong* consists of two or three† vowels united, which are pronounced together, and express a double sound. A *syllable* is a sound that is pronounced at once, and which cannot, or ought not to be divided. A word, that is composed of one syllable only, is called a *monosyllable*.

V. Among the distinctions which grammar makes in vowels, and which are not the same in all languages, on account of the great difference in pronunciation, the most remarkable is, that of *long* and *short*; by reason of the great effect it has on common discourse, as well as in eloquence and poetry. They apply these terms, though improperly with regard to modern languages, to those vowels on which we lay
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more or less accent in pronouncing them; and these render the syllables they belong to constantly longer or shorter *. Custom, and the example of those who speak correctly, are the only rules by which they can be determined. The grammar of each language teaches the true pronunciation of vowels, consonants, syllables, and the words they compose. But as grammar is wrote, and speaks to the eye only, and as pronunciation is distinguished by the ear, the true method of pronouncing must be learned by conversing with those to whom the language is natural, or with a good master; and this is almost the only part of grammar in which a master is necessary to a person of judgment and attention: all the rest is to be learned by a good grammar, where the intelligent scholar will acquire it as well as from his instructor, and oftentimes better.

VI. By *the parts of a discourse, or parts of speech*, is meant a collection of all the several sorts of words that we use in a language to express our thoughts. In the French tongue they count nine sorts of words, different in their properties, which are, 1. *The noun*: 2. *article*: 3. *pronoun*: 4. *verb*: 5. *participle*: 6. *adverb*: 7. *preposition*: 8. *conjunction*: and, 9. *interjection* §. But before we inquire into the particulars of these parts of speech, it is necessary to explain what is meant by *gender*, *number*, and *case*. The gender is the manner of distinguishing the sexes by the expression; and, in general, all that is male or female. In the French language there are only two genders: the first is called masculine, and is distinguished by the articles *le* or *un*; and the second, called feminine, is denoted by *la* or *une*. In some other languages they use also the neuter gender, the
common

* See the author's opinion on this matter in the chapter on poetry.

§ There are likewise nine parts of speech in the English language; but we omit the participle, or rather consider it as a part or property of the verb, and add the adjective, which the French grammarians consider as a part or property of the noun.

common gender, the general gender, &c. †. The number is the method of expressing *one* or *several* things: there are consequently two numbers, which are called *singular* and *plural*. The case is the method of expressing the several relations that things have to each other. There are six in each gender; which are the *nominative*, *genitive*, *dative*, *accusative*, *vocative*, and *ablative*.

VII. The noun is a word which we make use of to excite, in the mind of another, the idea of any being. When it expresses the substance of a being simply, and without any regard to its qualities, it is called a *substantive*; and when it expresses the mode or properties of a being, an *adjective*; as when we say *a man*, and *a great man*. Nouns substantive are again distinguished into *appellative* and *proper*. The first are applicable to the individuals of a class, gender, or species of beings, as angel, man, woman, horse, house: and to these may be added the article and pronoun, to determine the gender, number, and case. The second express the idea which is peculiar to any particular object, as Cicero, Bucephalus, Rome. The noun adjective conveys the idea of the manner of existing, of the mode, attribute, or quality, and is to be applied to such objects as are possessed of that quality, as great, handsome, ugly, &c. To these adjectives belong degrees of comparison, according

† The English language makes no distinction of masculine and feminine, except in such words as denote animal beings; and there only, by prefixing the pronouns of the third person, as he, she, him, her, his, hers; the termination still remaining the same, except in some few instances, as duke, dutches, actor, actresses: and this simplicity is no small excellency in our language. In French, and in Italian, every word is either masculine or feminine, whether it denotes an animate or inanimate being, and is attended by a masculine or feminine article or adjective. Now these variations are of very little use, and at the same time greatly embarrassing, not only to foreigners, but even to the natives, when they have occasion to make use of such words as are not very common. The Germans, by adding the neuter to the other two genders, and by varying the terminations in the different cases of their nouns, have made their language still more unnecessarily complex and difficult.

according as the object possesses the qualities that are attributed to it in a greater or less degree : and they are called *positive*, which conveys a simple idea only ; or *comparative*, which denotes a quality compared to another of the same nature, and of a greater degree ; or *superlative*, which gives the idea of a quality that is in the highest degree of excellence.

VIII. The *article* is a word that is put before nouns, to express the quality, gender, number, and case, in which the object denoted by that noun is to be taken. The article is either *definite*, *indefinite*, or *partitive*, as *le* and *la*, *un* and *une*, *du* and *de la*. *Pronouns* are words that commonly supply the place of nouns : of these they reckon seven classes, which are called *personal*, *conjunctive*, *possessive*, *demonstrative*, *relative*, *absolute*, and *indefinite*, as *I*, *thou*, *me*, *he*, *she*, *him*, *her*, *we*, *us*, *you*, *they*, *them*, *it*, *my*, *mine*, *thy*, *thine*, *his*, *our*, *their*, *who*, *whom*, *whose*, *which*, *what*, *this*, *that*, *these*, *those*, *whosoever*, *whatsoever*, &c.

IX. *Verbs* in general are words that are used to express either *actions* or *passions*. They unite objects with their attributes ; they affirm or deny ; they restrict or amplify, &c. The verbs, that are called auxiliaries, are, *to be* and *to have*, and these are of continual and indispensable use, especially in the French language. It must be observed, that verbs are susceptible of *number*, *person*, *tense*, *mood*, and *regimen* ; that they are ranged into *conjugations*, which shew the different terminations of a verb, according to the number, person, tense, and mood in which it is used ; that there are in the French, as in the Latin language, *four regular conjugations* * ; but use or abuse, or the analogy of the word itself, occasions some verbs not to follow the regular terminations, and such as do not are called *irregular verbs* :
and

* There is properly only one conjugation in the English grammar. All words that do not conform to that being justly referred to the class of irregulars : and this is another advantageous simplicity in our language.

and moreover, that verbs are *active*, *passive*, or *neuter*, *personal*, or *impersonal*, &c.

X. The *participle* is a noun adjective, which has some of the properties of a verb, and is so called because it participates of the nature of a noun adjective, and of the nature of the verb. It is joined to a substantive, of which it expresses some quality or attribute, and it borrows from the verb the signification, the regimen, and distinction of tense or time. The participle is either *active* or *passive*, as, having, loving, reading, working, loved, esteemed, frequented, subtracted, created, surprised, enterprised, &c.

XI. The *adverb* is a word which serves to modify or determine the signification of another word, or to express some circumstance belonging to it, and which presents of itself a distinct idea, without being subject to any regimen; as when we say *I love learning*, or *man acts*, the signification of the verbs *love* and *act* is simple; but when I add to it, and say, *I love learning greatly*, or, *man acts unjustly*, the meaning is then modified by the addition of the two adverbs *greatly* and *unjustly*. They are divided into seven principal classes, which are called adverbs of *time*, of *place* or *rank*, *quantity* or number, of *affirmation*, *negation* and *doubt*, of *comparison*, and of *quality* or manner.

XII. *Prepositions* are words that serve to distinguish the different relations that things have to each other; as *within the house*, *with the king*, *into such a place*, *opposite the palace*, *because of the famine*, *with regard to the pension*, &c. In all these phrases the prepositions, *within*, *with*, *into*, *opposite*, *because of*, *with regard to*, express the relations of objects. These words are usually placed with the words they govern, and cannot be used without regimen, from whence they are called prepositions. They are distinguished into prepositions of *place*, *situation*, *order*, *time*, *term*, *cause*, &c. They govern either the genitive, ablative, dative, or accusative case, at least in the French language, in which this work was originally wrote.

XIII. Con-

XIII. *Conjunctions* are indeclinable words, that express various operations of the mind, and which serve to connect the members or parts of a discourse. They are distinguished either by their expression or by their signification. By their expression, seeing they are sometimes simple, as, *and, also, or, that,* &c. and sometimes formed of several words, as, *in order to, on condition that, but for all that,* &c. By their significations they are divided into fourteen principal classes, which are conjunctions *copulative, disjunctive, adversative, restrictive or exceptive, conditional, suspensive or doubtful, concessive, declarative, comparative or of equality, augmentative or diminutive, causal or causative, illative or conclusivæ,* those of *time and order,* and lastly, those of *transition.* Grammar gives definitions, rules, and examples relative to all these.

XIV. Lastly, *Interjections* are words that express some sudden motion of the mind, as in joy, grief, fear, aversion, incitement, &c. as *aha! good! alas! O God! ha! fy, fough! ho! courage! softly! peace!* &c. These are principally distinguished by the tones of the voice in pronouncing them.

XV. Such is the nature of those words of which every discourse is composed, and which are called the parts of speech. The particular rules for the proper use of these words, and the manner in which they are declined and conjugated, must be learned from the grammars of the different languages, as well dead as living. *Syntax* is the construction or arrangement of all words in general which form the parts of speech, and of each species or class in particular, according to the rules of grammar. But it is impossible to give any precepts here relative to this matter, because the different natures of languages, the different customs, and many other considerations, prevent the prescribing particular rules in this case. The parts of speech are not even the same in all languages. The Latin, for example, reckons but eight, having no article. There are however, some universal rules, which we shall here just mention: such

such as, that the noun adjective must agree with its substantive in gender, number and case: that all verbs must be in the same number with their nominative case: when one noun governs another the governed noun should be in the genitive or ablative: that every nominative must have a verb, either expressed or understood; and on the other hand, every verb should relate to some nominative, either expressed or supposed: that every noun adjective ought to relate to some substantive, because there can be no attribute without a subject: that every genitive depends on some word that governs it; and so of the rest: but, as we said before, the particular rules depend, almost always, on the practice established in each language.

XVI. The same may be said of orthography, or the method of writing words correctly, that is, with their proper letters in their proper order. It is in its nature so very different in all the various languages; it depends so much on the pronunciation, which is infinitely diversified; it is founded so essentially, in each language in particular, on the received practice, on the example of the best writers, on the caprice of celebrated authors, on ancient customs and prejudices, and on the continual alterations that arise in living languages, that I greatly doubt whether it be possible to form any rules, established on principles, that can be fixed and permanent with regard to any living language whatever. All that we find on this head in grammars, in treatises wrote expressly on the subject, and in the orthographic dictionaries, is founded on principles that are too general, or arbitrary, or on assertions without proof, or on decisions without authority, or such as have never been strictly followed, and against which other learned men oppose their authority*. I do not know, in the French language,

* The true rule of orthography is certainly that which is observed by the Germans and Italians, and that is, to retain no letters that are not pronounced. The objection, that this rule can be no standard, because the pronunciation itself is continually

language, any two celebrated authors, that in every particular follow precisely the same orthography. Nevertheless, in whatever language we write, we should understand the general rules of orthography, otherwise we shall fall into errors that would be unpardonable in a school-boy. To write without a due regard to orthography is, in fact, not to write at all: it is a plain indication of ignorance in etymology, or the true sense, the force and value of expression, and that it is used at a venture; in a word, it is an evident proof that the writer is totally illiterate.

XVII. We shall finish this sketch of grammar, with some short remarks on the faults that are committed against the purity of style in general, and which will serve at the same time as a preparative to the following chapter on rhetoric, or the art of *speaking with propriety*. The first of these faults is the use of *barbarous terms*, such as are either so old, so new, or so uncommon, as to be intelligible to few persons only. The second is the *gallimatia*, or that confusion and obscurity which arise from a number of phrases placed without order or judgment. The third is *ambiguity*, which proceeds from such
expres-

ally varying, is altogether trifling. Not the rules of language only, but the laws and customs of society, are subject to incessant variations, notwithstanding which, they are justly regarded as standards, till such time as they are abrogated or superseded by different laws or customs. The French by making great alteration in their pronunciation, and very little in their orthography, have been guilty of an egregious absurdity; as they have thereby rendered their language very difficult to be wrote by themselves, or to be pronounced by foreigners, and the difference is now become so great, that were they to attempt to write as they speak, their language would be scarce intelligible. The English writers have not been quite free from negligence in this respect; though the difference between the pronunciation and orthography of our language is as yet so inconsiderable, that it might be reduced to the true standard with a very trifling inconvenience, whatever Swift, or some other capricious writers, may have said to the contrary. It may be most eligible, however, to introduce the alteration in works of amusement, where, if any obscurity should at first arise, it will be of little consequence.

expressions as have a double sense, and consequently render a discourse obscure. The fourth is long and frequent *parentheses*, which interrupt the thread of the discourse, and suspend the sense. The fifth is a *bad arrangement of the words*. The sixth, *long periods*, which render a discourse obscure and perplexed, by presenting too great a number of ideas to the mind at the same time, and consequently require an uncommon attention. The seventh is *barbarisms* and *solecisms*, or such faults as are directly contrary to the practice of the language and the rules of grammar. The eighth is the *phæbus*, which consists in swelling, bombast expressions, and such as shine with a false lustre only. The ninth is the too frequent use of *metaphors* and *extravagant allegories*; a fault into which modern writers too often fall by mistaking them for real beauties.

C H A P. III.

R H E T O R I C.

I. **I**N all the liberal arts, as well as in those that are merely useful, and those also that are the most sublime, there is a *mechanism* which must necessarily precede the application and operations of genius. This mechanism has its technical terms, those denominations, those peculiar phrases, which custom has assigned to each art, to preserve a perspicuity and brevity in the expression, to render each idea more distinct, and to avoid, as much as possible, all ambiguity. From hence arose the saying that *every art has its jargon*. They who would proceed securely in their career, or desire to excel, will not fail to learn this mechanism and its terminology; but, when it is become entirely familiar to them, they ought to take as much pains to avoid it, and even to forget it, as they did to learn it; as nothing is so disagreeable in the practice of the polite arts, as to see the least traces of pedantry. Eloquence and poetry have their
thorns,

thorns, their asperities, as well as the other arts. The Muses, before they introduce their disciples into the brilliant sanctuary of their sciences, conduct them through a path that is but little ornamented, little attractive. Dull grammar and rhetoric are sciences dry and barren in themselves, and which require a strong exercise of the memory, but little of the judgment, and scarce any of the imagination, but what *prepare* it for action, and to act effectually. We are therefore quite sensible, that the analysis we shall here make of the mechanical part of oratory will favour of pedantry, and become tedious. But we are constrained, how unwilling soever, to engage in this troublesome business; being persuaded however, that, when our readers shall have gone through it, they will agree with us, that those things are not always frivolous which appear so; and that as all is not gold that glitters, so all that is gold does not always glitter.

II. The business of oratory is to teach us to express our thoughts in a manner that is perspicuous and pleasing. To attain this end, it is necessary to be provided with a very copious store of words and phrases, not to produce a disagreeable profusion, and to fall into paralogisms or prolixity, (which is the most glaring imperfection in style, as precision and brevity constitute its greatest excellence) but to be enabled to make a judicious selection. Now to do this, it is not only necessary to be acquainted with a great number of words, but to know their just value; for strictly speaking, there are no terms that are perfectly synonymous: and this is what is called having a critical knowledge of the language in which we speak or write.

III. Secondly, There is an art in connecting these words and phrases with *regularity* and *grace*: it is to little purpose that the most just and most brilliant thoughts arise in the mind of the orator, if he know not how to express them with propriety, for in that case he will never obtain the suffrage, and still less the admiration of his auditors. Common rhetoric
(and

(and which we may also call mechanical) teaches, therefore, the rules that assist the mind, 1. In procuring plenitude of expressions: 2. In knowing their value: 3. In making a judicious choice from among them: 4. In connecting them with regularity. Grammar, as we have seen in the preceding chapter, teaches us to express our thoughts correctly. When, therefore, the orator is provided with these two guides (grammar and rhetoric) he may give the reins to his genius, and rush unconcernedly into the boundless field of eloquence.

IV. *Rhetoric*, taken in this sense, has therefore four principal objects, which form so many branches of this art, and consist in the knowledge of,

1. An abundance of words, their value and their choice.
2. The connexion of words and periods,
3. The connexion of periods, or chrias.
4. The connexion of chrias, or the forming a complete discourse.

We shall now explain these objects in their proper order. Every man, who speaks or writes, has occasion for these rules, and this kind of rhetoric, to enable him to speak and write with propriety. But every man is not called to harangue in the courts, or in the pulpit, or in any public station, and there to excite the passion, to convince the understanding, to transport the soul: in a word, *oratory* is the most sublime part of rhetoric, or more properly a particular art, which is meant by the word *oratory*; that art, of which Demosthenes, Aristotle, Quintilian, Cicero, Bouffet, &c. have been the masters and the models; and it is the art of which we shall describe the principal rules in the following chapter.

V. When we speak here of the abundance of words, we do not mean number merely, such as may be found in a dictionary, or in the store-house of the brain, but a quantity of such phrases as are proper to express all possible ideas. This kind of abundance is obtained, 1. by *adjection* or adding, and 2. by *variation*. Adjection is, when we add words, or even propo-

propositions, to other words or propositions. The words, that may be joined to others, are either *adjective*, *substantives*, *adverbs*, *verbs*, or *synonyma*. Beside what grammar teaches with regard to purity, rhetoric informs us that *epithets* should be *just*, that is, agreeable to the idea of the primitive word to which they are added; so that we should not say a *pale* statue, or that the *blue* sky does not give us rain, &c. and in general, it forbids the too frequent use of epithets, even the most just, because by their abuse the discourse is enervated. It teaches us likewise, that in using synonyma the last should always be the most energetic; that these adjectives should be always necessary, and should express some essential property of the object, &c. Therefore to amplify a proposition, and to render it more conspicuous, or more persuasive, they make use of the adjection of several parts of speech, and sometimes even all of them: and lastly, they add other entire propositions, which serve to elucidate the subject itself, or some property of the subject (*subjectum* & *prædicatum*) or to shew the connexion. It is here that rhetoric furnishes instructions relative to the *periphrasis* and *allusion*, and to the *topics* and common places included in this little verse: *Quis, quid, ubi, quibus auxiliis, cur, quomodo, quando?* which it teaches to amplify by similitudes, opposites, examples, testimonies, praise, blame, &c.

VI. *Variation* is either grammatical, rhetorical, or logical. The grammatical is, when we change the parts of a discourse, as for example, the infinitive of a verb into a substantive, and so of the rest. The rhetorician does the same by *tropes* and *figures*. The *trope* changes, in some degree, the natural signification of a word. There are four principal tropes, which are the *metaphor*, *metonymy*, *synecdoche*, and *irony*. The *metaphor* makes use of words that include a comparison or simile, and the *allegory* continues and amplifies that comparison. The *metonymy* is of four kinds, (1.) *causa pro effectu*, when the cause is put for the effect: (2.) *effectus pro causa*, or the effect

for the cause: (3.) *subiectum pro adjuncto*, the principal object for a quality of that object: and (4.) *adjectum pro subiecto*, a property or quality for the object itself. We may also refer to the metonymy what the rhetors call (5.) the *metalepsis*, when we put the antecedent for its consequent, or the consequent for its antecedent; and (6.) the *hypallage*, when we transpose the object and the quality of the object, as when we say, the people gape after nothing but places of public entertainment, for the places of public entertainment are filled with the people. The *synecdoche* puts sometimes a part for the whole, and sometimes the whole for a part. The *heterosis*, the *hyperbole* or exaggeration, and the *antonomatia*, are species that belong to this genus. Lastly, the *irony* makes use of words whose signification is directly contrary to what it seems.

VII. *Figures* are modes of expression that represent a thought either more forcibly or agreeably than in the common method. They are of two kinds. The one are said to be of *diction*, and imply either a deficiency, a superfluity, or a repetition of words of like import, and are almost always bad: and the others are called *sententious* (*sententiæ*) and are either *probatory*, *amplificatory*, or *affectuous*; and may be considered either as useful or agreeable. We will begin with the figures of diction, and endeavour, at least, to make them intelligible by their names: and here we must familiarize ourselves with certain technical terms that are unpleasing enough. We must know, for example, that an *ellipsis* signifies an omission of one or more words; an *asyndeton*, the omission of the copulative *and*; *pleonasm*s are superfluous words; *polyyndeton*, a redundancy of the copulative *and*; *synonyma* are words or phrases of the same meaning; *antanaclasis*, a word repeated two or more times, but taken in a different sense; *ploci*, a word repeated in a different sense, but in the same phrase; *anaphora*, the same word repeated at the beginning of several successive phrases or periods; *epiphora*, or *epistrophe*, the same word repeated at the end; *symploce*, the repetition

petition of a word at the beginning and the end of a phrase; *epanalepsis*, a repetition of the same phrase at the beginning and end of a period; *anadiplosis*, when a word that ends one period begins the next; *epanodus*, when two or more words are used alternately in an inverted order; *epizeuxis*, the immediate repetition of two words; *climax* or gradation, when a word repeated connects a phrase with that which follows; *polyptoton*, when the same word is repeated in different senses, and with different terminations; *paronomasia* makes use of several words that have the same termination; *parechesis*, when words are used which have syllables that have the same sound; *homæoteleuton*, when the words that are placed at the end of each phrase rhyme with each other; *homæoptoton*, when phrases end with words that are in the same case, or in the same tense; and lastly, *paregmenon*, when words are connected whose etymology are the same.

VIII. With regard to the *sententious figures*, the PROBATORY are the *prolepsis*, or anticipation, when we prevent objections by refuting them; the *subjection*, when we refute several objections at the same time; *communication*, when we may be said to consult our audience, and suppose that they are of our opinion; *confession*, when we grant our adversary all that he demands, without doing ourselves any prejudice; *concession*, when we allow a part of what is demanded, reserving the strongest argument. The principal figures of the AMPLIFICATORY are called the *gnoma*, or sentence, when we make use of a general opinion, a common proverb; *noema*, when we apply this saying to any one; *chria*, when we cite a like sentence with the name of its author; *distribution*, when we divide a whole into parts, or a genus into its species; *etiology*, when we add to any proposition the reason from whence it arises; *color*, when we make use of a plausible reason; *hypotyposis*, or description, when we paint an object in lively and natural colours; *imago*, or *icon*, when, by the aid of the particles of similitude, we make a short comparison;

son; *paradigma*, when we cite an example; *comparatio*, or similitude, when we make a comparison by a *protasis* and *apodosis*; *collation*, when we present two objects, in order to make their conformity or difference appear more evident; *dissemblance*, when we shew the disagreement between two objects; *paradiastole*, when we distinguish two objects that are commonly confounded; *antimetabole*, when we produce a different sense by the transposition of words; *antitheton*, when we join two contraries; *oximoron*, when we assert a fact, or deny it with judgment; *digression*, when we quit the principal subject to treat on such as are accessory and relative to it; *transitio*, when we pass from one subject to another; *rejection*, when we refer an object to another part; *revocation*, when, after a short digression, we restore the thread of the discourse; *epiphonema*, when we end a discourse by an energetic sentence; *auxesis*, when we exaggerate a matter too much; *tapinosis*, when we pretend to be unwilling to say a thing, and yet say it at the same time; *incrementum*, when we speak by gradation; *periphrasis*, or circumlocution, when we make use of many words to express that which might have been said in a few. Lastly, the principal figures of the AFFECTUOUS are *exclamation*, when we express ourselves with great emphasis on any subject; *interrogation*, when we propose any thing in the form of a question; *dubitatio*, when we doubt, or seem to doubt of what is said; *correction*, when we revoke what we have said, in order to put something else in its place; *reticentia*, when we interrupt the discourse; *sermocinatio*, when we make some person speak; *prosopœia*, when we make some other being than man speak, as some inanimate object, &c. *apostrophe*, when we direct our discourse to one that is not present; *taenism*, when we excite to joy and gaiety; *tarrhesis*, when having something disagreeable to say, we soften it with something agreeable; *obsecratio*, when we pray, intreat, implore, or conjure; *admiratio*, when we admire; *votum*, when we wish, or make a vow; *execratio*, when we make imprecations; *surcast*, when

when we ridicule the dead, the dying, or unfortunate; *diafirm*, when we ridicule any other subject, or treat any object with contempt; *asteism*, when we rally agreeably; *charientism*, when we reply with politeness and pleasantry to any thing rude or ill-natured; *mimesis*, when we repeat the words of another in a jeering tone. Thus much for tropes and figures.

IX. It remains to speak of the *logical variations*. These are made by the *topics* or *common places*; which are,

1. The denomination (*locus notationis*):
2. The definition and description:
3. The genus and species:
4. The whole and its parts:
5. The causes, as the efficient, final, material, and formal cause:
6. The effects:
7. The accessories and circumstances:
8. The comparables:
9. The opposites:
10. The examples and testimonies.

X. The denomination (*notatio*) considers the name of an object, that is, the etymology or derivation of the word, or from whence it derives its origin; the *homonymy*, or *equivocation*, when a word has different significations; the *synonymy*, when the same thing is expressed by different names; the *anagram*, or the meaning formed by the transposing of the letters. The definition and description expresses the nature and properties of any object, the first in a manner more confined, and the other more explicit. The genus expresses an extensive idea that comprehends several species; and the species expresses a more confined idea, of something that belongs to a genus. The whole implies an object that is entire, and capable of being divided; and the part is a portion of that whole. The efficient cause is that from which something is derived: it is either *principal*, that is, the true origin of an object; or *instrumental*, that is, the mean by which it is produced; or *physical*, which is that from which the object immediately arises; or *moral*, from whence

whence the object accidentally results, or which causes it to take place. The final cause is the design, the end for which any thing is done. The material cause is founded in the nature and essence of the thing itself. The formal cause is founded in the attributes, the essential qualities and properties of the object. The effects are the necessary consequences that result from the efficient cause. The accessories are those things that belong to an object, either properly or accidentally. The circumstances are the situations that accompany an object, and are divided into *historical* and *moral*. The comparables are relations or resemblances, and are distinguished into *similar*, *dissimilar*, and *emblematic*. The opposites are such objects whose natures and properties are directly contrary to each other. The examples consist in reciting similar events, or in relations of parallel or equivalent matters. The testimonies are nothing more than the attestations of a pen or a tongue that is worthy of belief: and these are what compose the topics or common places, from whence the orator draws his arguments and forms his reasonings.

XI. We now come to the second part of rhetoric, which consists in the connexion of words and phrases, or in *periods*: and here we have two principal objects to consider, which are the *adjection* or *junction*, and the *punctuation* (see sect. 4.) By a period is meant a short part of a discourse, but the members of which taken together form a complete sense. The period is either *simple* or *compound*; and it is necessary to know the *composition*, the *dilatation* or manner of extending it, and the *contraction*, or manner in which it may be abbreviated. The *simple period* consists but of one logical proposition; the subject and attributes of which may be amplified by all sorts of adjections. These adjections are either *verbal* or *real*. We have already spoke of the verbal adjection in sect. 5. The real adjections are drawn from the topics or common places, of which we have also treated in the sect. 9. The *compound period* is, when we add (1.) other predicates to a subject, or (2.) contrary predicates, or

else (3.) other subjects to the predicate, or (4.) contrary subjects ; or still otherwise (5.) to the entire proposition the etiology or account of the causes ; or (6.) convenient amplifications. In the four first cases, a period, so composed, is called either *concessive*, or *adversative*, or *conclusive*. In the fifth case, a period, so composed by the adjection of etiologies, is called either *conditional*, or *consecutive*, or *casual*, or *explanative*. In the sixth and last case, a period, composed by the adjection of amplifications, is expressed by the single word *comparative*, and contains a proposition, to which is added a comparison, with the explanation of the object to which it is compared, the allusion, the example, the testimony, &c. the whole connected with the words *as*, *so*, *that*, *just as*, &c.

XII. *Punctuation* teaches, 1. The usual distinctions in the periods of a written discourse : 2. The manner of employing these distinctions. The marks of which are,

1. . The point :
 2. , The comma :
 3. : The colon :
 4. ; The semi-colon :
 5. ? The point of interrogation :
 6. ! The point of exclamation :
 7. () The parenthesis :
- To which may be added,
8. The two points which are placed over an i, to shew that it is to be pronounced separately, and not as a diphthong.

Rhetoric here precisely distinguishes the cases in which each of these signs are to be used, in order to mark the gradual divisions in a discourse. It shews, also, in what instances it is convenient to make use of *capital letters*. The use of these is not the same in all languages. The Germans, for example, place a capital letter at the beginning of every noun substantive. The method of totally excluding capitals, even at the beginning of proper names, or a period, is very injudicious, as it tends greatly to confound the periods.

periods, and does not in the least aid the local memory; whereas the capital letters serve to discern the passages with facility. It moreover fatigues the sight, and makes the printed page appear like a mere chaos, without order and without taste.

XIII. The dilatation or extension of periods (see sect. 2.) shews the method of making several periods out of one. This extension is made by adding to the subject, to the predicate, and to an entire proposition, new propositions and periods, and which may be done as well with regard to simple as compound periods, either by citing the form of judgment (*formulam judicantem*) as a particular period; or by drawing from the adjections to the subjects and attributes, new propositions, and reducing them into as many periods. The contraction of periods, on the contrary, is employed in reducing many periods to one or a few: and this is performed by a judicious recision of a superfluous number of adjections, as well subjects as predicates; or by selecting the principal propositions of each period, in order to reduce them to a small number or a single proposition. And thus rhetoric furnishes particular rules by which a discourse too dilated may be contracted, that a concision and energy may be obtained, and a disgusting prolixity avoided.

XIV. We are now come to the third part of rhetoric, which consists in the connexion of periods, or in propositions and *oratorial syllogisms*. (see sect. 4.) An oratorial or rhetorical syllogism is, in fact, nothing more than a just form of argument, composed of a number of periods, connected with each other. The syllogism itself, and its principles, are drawn from logic; but the manner of making it appear clear and agreeable, in short, its arrangement, is the object of rhetoric. A syllogism is composed of a protasis and etiology, followed by a just consequence, and commonly in three propositions: as for example,

Protasis. *We should not laugh incessantly.*

Etiology. *For immoderate laughter is a mark of folly.*

Syllogism major. *Immoderate laughter is a mark of folly.*

Syllogism minor. *We should avoid that which is a mark of folly.*

Conclusion. *Therefore we should not laugh immoderately on every occasion.*

Now as every syllogism consists of three propositions, and as we know by the nature of numbers, that three units may have six different combinations, it follows that we may dispose the three propositions of a syllogism into six different positions, by placing them in the following manner :

- | | | |
|--------------------|-----------------|------------------|
| 1. The major, | the minor, | the conclusion : |
| 2. The major, | the conclusion, | the minor : |
| 3. The minor, | the conclusion, | the major : |
| 4. The minor, | the major, | the conclusion : |
| 5. The conclusion, | the major, | the minor : |
| 6. The conclusion, | the minor, | the major. |

It is necessary to observe here, that, in an oratorical syllogism, each proposition should form a period attended with all its attributes or adjections, and that due regard should be had to the relations that the propositions have to each other, whether the one be antecedent and the other consequent, or if the one be the protasis and the other the reason, &c. It is easy, in these cases, to join them by the particles of connexion ; but great care should be taken, that art do not predominate over nature ; for nothing is more disgusting than an affected style, or where we discover incessantly the traces of art.

XV. A *chria* (which is a Greek word that has been adopted by rhetoricians) is a thesis sustained by *reasons* and *amplifications*. The rhetors divide chrias into two classes. In the first they range those that are called *aphtonian* and *practical* : in the second, those they name *regular* (ordinats), and those that are called *inverse*. The aphtonian chria contains ten members, which are, 1. The eulogy of the author : 2. The paraphrasis or explication : 3. The cause or reason : 4. The contrary : 5. The similitude : 6. The comparison. 7. The example : 8. The testimony of the ancients : 9. A short epilogue : 10. The conclusion. This chria is either *verbal*, when we reason on the words

words of an author, and relate them by following the train of the ten parts above-mentioned; or *active*, when we cite or examine the actions, the behaviour or countenance of any one, by these ten parts; or *mixt*, when we report and examine the words and actions of any one by these same rules. As this *chria* is pedantic, and a mere slave to rules, we ought to make use of it but very rarely. The practical *chria* is of far greater use; it requires only the protasis and etiology, and, to extend the discourse, the amplification and conclusion. In the protasis, we may employ, either our own thoughts, or those of another; in the etiology, we may draw our arguments from that which is becoming and that which is indecent, from the useful or pernicious, the agreeable or inconvenient, from the easy or difficult, from those things which are necessary or such as are to be avoided, &c. It is here that rhetoric gives particular rules for amplification, and the objects from whence ideas may be drawn. The conclusion has two objects: it either recapitulates the thesis on which we have treated, and sometimes the arguments also; or, it draws consequences, general and particular, from the whole discourse that has been pronounced.

XVI. By a *regular chria* (*chria ordinata*) we understand that which follows the regular order in the use of the protasis, etiology, amplification, and conclusion, each in its natural rank: and by an *inverted chria* (*chria inverfa*) that where the order is somewhat reversed, and where we pass sometimes from the occasion, and sometimes from the amplification, to the thesis. It is of two different kinds, according to the transitions that are made use of, and which are called *chria per antecedens & consequens*, or *chria per thesin & hypothefin*. By means of this last sort of *chria*, rhetoric teaches what is the thesis and hypothesis, and from whence they are derived; what is the method of disposing the *chrias*, their natural division; what it is that forms the protasis; what is meant by disposition and artificial division of *chrias*; the use of etiology and amplification, that of argu-

ments, and what arguments may be used in proving of theses; what are the objects of comparison that are made use of, and their different kinds, or degrees of resemblance; what are the dissimilar objects and their kinds; what is meant by an easy, moderate, and difficult application; the different sorts of allegories, and what is to be understood by a free and constrained allegory, of the first or second, the simple or composite order; what is the method of disposing, dividing, and amplifying of theses and hypotheses; and all these objects it elucidates, moreover, by pertinent examples, in order to give its disciples more clear and more comprehensive ideas of these matters.

XVII. We are now to treat of the fourth and last part of rhetoric, which consists in the connexion of clauses, or in the forming of a complete discourse. (see sect. 4.) It will be readily conceived, that, as all the parts of a discourse are here united, rhetoric must furnish rules for connecting them with regularity and embellishment. Anciently rhetoricians divided discourses into three sorts, which they called, 1. Ordinary elocution, that is, such as is used in common conversation: 2. The ordinary elocution in writing, from whence comes the epistolary style, the form and disposition of letters on all sorts of subjects: and, 3. The elocution of compliments for all occasions, as well verbal as written. All these matters are directed by particular rules in the old systems of rhetoric, where those, who are curious to see them, may easily find them. But as it has been found, that these rules, some small matters excepted, are already comprised in the other parts of rhetoric, and that far from being of any great utility, they, on the contrary, only serve greatly to fatigue the memories of young students; and lastly, that they accustomed them to the use of an elocution that was pedantic, frothy, and affected; these rules have been suppressed, and the writers on rhetoric now content themselves with laying down the following precepts:

XVIII. The ordinary language of life, or common elocution, among men of education, should be natural,

tural, clear, noble, and graceful. No expressions should be used but what are just, intelligible, and decent, such as are neither improper, perplexed, low, rude, or immodest. All sorts of execrations, or impious invocations, should be totally banished, as being only practised by the vilest of mankind. The adage, the simile, and other uncommon ornaments of speech, should never be used but with taste, and with great moderation. Every kind of circumlocution, every ambiguous word and phrase, and all pompous expressions, should be most carefully avoided. We should accustom ourselves to speak with perspicuity, concision, and regularity, but at the same time should constantly remember, that this regularity ought not to be too rigorously observed, nor too apparent in our discourse, but that here, as every where else, the highest perfection of art consists in an elegant irregularity.

XIX. The epistolary style should follow the rules of ordinary conversation. We should write as we speak. The most perfect models of letters, from those of Cicero, to those of Madam de Sevigne, are such as are wrote in the most natural style. The imitation of the best models, and reflection, will much sooner make a good letter-writer, than the study of all the rules. However, as our thoughts are not so soon traced on paper as they are expressed by speech, and as every one who writes is supposed to have had time to reflect, and as it is not possible, moreover, in an epistolary correspondence to elucidate imperfect or obscure expressions by repetitions or illustrations, and as in general, according to the old Latin proverb, *verba volant sed scripta manent*, it is but natural that we should be careful to express ourselves with somewhat more order, more clearness, purity, and even grace and elegance, in a letter, than in common conversation. There are also certain decorums that are established in the epistolary commerce: and rhetoric prescribes rules for that purpose, as well with regard to the essential form of a letter, and the distribution of the matter it contains, as to ceremonies, &c. It

teaches, also, to distinguish between letters of mere complaisance, those of friendship, business, commerce, solicitation, condolence, &c. and it shews what sort of style is to be observed on all these different occasions.

XX. Lastly, The business of *compliments* (taking the word in the strict sense) has been abolished, or at least the ridiculous use of them greatly diminished among the polite world. The man, who should now offer a compliment laboured after all the rules of rhetoric, would only excite laughter, and deservedly pass for a coxcomb. Nothing is more disagreeable to a company than a compliment of this kind, and most of all to the person to whom it is made. Now, since it has been discovered that true politeness consists in giving to every one the greatest satisfaction in our power, it naturally follows, that we must necessarily proscribe the use of *empty*, and above all, *long* compliments. All the schools of polite education, as well as the theatres, have shewn the ridicule of such practice; and if we are now constrained by some circumstance in life to make a *real* compliment, we should do it in expressions that are concise, and that include a sentiment which is lively, strong, clear, comprehensive, and agreeable; and should take great care not to make ourselves ridiculous by a rigid observance of the rules.



C H A P. IV.

E L O Q U E N C E.

I. **W**E are come out of a deep mine, where by a glimmering light we could discern dull objects only, the machines and tools of the labourers: but we have brought with us on the earth pure gold, which we will examine by the light of the sun, and then deposit in the workshop of the god of genius.
You,

You, his children, you, the sons of Apollo, and the disciples of the Muses, come and make a noble use of this ore! Form it into vases, statues, ornaments, into the precious works of genius. But first learn the precepts of your sublime art. You now know what it is to form a regular discourse; grammar and rhetoric have taught it you. Learn what yet remains to know, the method of putting an elegant and correct elocution successfully in practice; learn to be truly eloquent.

II. Eloquence, then, is an art that we must make use of whenever we are called to speak in public; or whenever we write on any subject where elocution is necessary, and which is equally speaking in public. Eloquence is either *political* or *sacred*. This distinction is quite necessary, not only on account of the different objects by which it is employed, but also with regard to the rules that are to be followed in the theory and practice, which are not generally the same. For which reason we shall here divide it into two chapters; in the first of which we shall treat of general or political eloquence, and in the other, on that of the pulpit, or sacred eloquence, which is likewise called *homily*.

III. Political eloquence is of different kinds, according to the subjects on which it is exercised. We shall therefore have occasion here to treat on,

1. Eloquence in general, and its precepts:
2. The eloquence of the bar, or pleading:
3. The academic eloquence, or that which is employed in public discourses in schools, colleges, universities, academies, &c.
4. Political eloquence, or that which is used in haranguing the people, as in the senate, the council, &c.
5. The eloquence of ambassadors, or that which public ministers make use of in their addresses or congratulations, or in the discourses they pronounce at their public audiences of princes, or their ministers, &c:

6. The

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6. The eloquence that should be observed by sovereigns in their public acts:

7. The various kinds of eloquence that should be used in treatises on different subjects.

IV. With regard to eloquence in general, we shall observe in the first place, that as there are three principal branches of oratory, which are to *instruct*, to *please*, and to *affect*, so there are three corresponding species of eloquence, and which are usually called the *simple*, the *sublime*, and the *temperate eloquence*: and secondly, that every public discourse, which is formed according to the rules, has, or ought to have, six different parts or members, which are, 1. The *exordium*, 2. the *narration*, 3. the *proposition*, 4. the *confirmation*, 5. the *refutation*, and, 6. the *conclusion*. For the due treatment of all these parts, and for the constructing of a masterly discourse, there are four principal objects which the orator should constantly keep in view, and which are, 1. the *invention*, 2. the *disposition*, 3. the *elocution*, and, 4. the *peroration*. We will endeavour to explain all these matters as briefly as possible.

V. Although we have remarked in more than one place, that invention is not subject to the rules of any art whatever, that it is the effect of a lively imagination, the produce of a happy genius, yet this genius may be strengthened and guided by certain rules, not only with a view to point out those objects on which its powers may be exercised, and to shew the sources from whence it may draw its thoughts and its images, but also to enable it to discern those rocks against which it would be in danger of running without these guides. We shall therefore say, that invention is to be exercised, 1. on the theme or subject of the discourse itself, 2. on the propositions, 3. on the disposition or arrangement, 4. on the arguments, and, 5. on the exordium and accessory parts of the discourse. All these objects must engage the imagination of the orator.

VI. The theme is, 1. with regard to its nature, either simple or compound, limited or unlimited, either

either free or restrained ; 2. with regard to its matter, either scholastic, political, ecclesiastic, or mixed ; 3. with regard to its species, either demonstrative, deliberative, judiciary, or didactic ; 4. with regard to its property, either conjectural, definitive, or of quantity or quality. The art of eloquence, here, explains these denominations, and furnishes examples. When, therefore, the orator is called on to display his art and his talents in public, he ought to begin by carefully considering what is the *motive*, or what is the *occasion* on which he is engaged to harangue. He ought next to consider whether it be the simple, temperate, or sublime species of oratory, that will best agree with the nature of his subject and the quality of his audience : and after having examined, without prejudice, his talents and endowments, and having determined on one of the three species of eloquence, he will examine the subject of his discourse by all the topics that we have indicated in the 9th section of the last chapter, and he will certainly not want invention sufficient to produce a theme : on the contrary, he, who has the least power of invention, will find the themes flow in upon him abundantly, and his only concern will be how to make a happy choice ; in doing of which he will endeavour to make use of that theme, which is the most uncommon and singular, or, to speak more properly, that which is new, and most analogous to his subject.

VII. The proposition is yet more easily formed ; for frequently it is contained in the theme itself, and, to use the expression, proceeds from the brain at the same time, and often differs from it by such a variation, that it presents itself to the mind almost at the same instant. The orator sometimes distinguishes it particularly, and sometimes he connects it with the division or partition of the discourse. It is sometimes expressed in natural terms, and at others, in allegorical or figurative expressions, especially when that allegory has been prepared by the exordium. It is sometimes, moreover, preceded by panegyric on the subject ; and, lastly, it ought to be concise and clear,
in

in order to engage the attention and assist the memory of the auditors.

VIII. With regard to the division or partition, it is only necessary to examine the nature and quality of the theme, to find the natural division of which it is susceptible. It is sometimes drawn from the efficient cause, or from the form, matter, effects, accessories, circumstances, the end, the integrity, utility, and pleasure, from the ease or necessity, or from their opposites; or from historic themes, or from the events which have preceded, accompany, or follow the matter, or else from the polemic themes, from the affirmative or negative opinion, or from the orator's private opinion, &c. We must remark here, that the divisions should not be too numerous; two, three, or at most four, are sufficient: a great number of parts is absurd. Lastly, the lines of the divisions should be conspicuous, and that the matter of one should not run into that of another.

IX. The arguments are drawn from the nature of the subject that is treated on, from the principles of the doctrine to which it belongs, or from experience. They are drawn, either directly or indirectly, from all the general topics of which the subject is susceptible; and they are applied, 1. either to the subject itself, or, 2. to the audience, or, 3. the orator. In the first case, they are called *persuasive*; in the second, *affecting*, because they are made use of to move the passions; and, in the third, *conciliating*, seeing they tend to procure the orator the favour or indulgence of his auditory.

X. The invention of the exordium is likewise very simple. It is formed merely by adding to the proposition an etiology, which affords a subject or else an amplification: and in these two parts we find the matter of a double exordium; the one of which is called by *antecedents* and *consequents*, and the other by *thesis* and *hypothesis*. We must also remark here, that the exordium should not be too long, or florid, and still less should it be mean and vulgar. The orator should not tire his auditors at the beginning with
prolixity,

prolixity, nor should he soar aloft on the wings of his eloquence and lose himself in the clouds, or tear up the earth with the impetuosity of his passion.

XI. Of all the parts of a discourse, that where the invention is most particularly concerned is in the *thoughts*. For the invention is extended not only to the plan and disposition of the discourse, but to the entire execution also : as every rational discourse must consist not of a mere arrangement of phrases, but of a regular chain of thoughts expressed in proper terms. The thoughts form, therefore, the essential part of eloquence, the words and phrases being nothing more than the dress or ornament : and the faculty of producing these thoughts is that which is called invention. This appears, therefore, to be the proper place to treat on thoughts, and not under the article of elocution, whose proper object is the choice of words, and their number and connexion. Thoughts, therefore, form the foundation and the body of a discourse. This word is less vague and more determinate than the Latin term *sententia*, which conveys an obscure and equivocal idea.

XII. The thoughts, therefore, are the productions that result from the operations of the imagination and reflection ; or the expression of ideas that the mind conceives, either by intuition or by the examination of every object that it perceives. The general precept that the art of eloquence here lays down is, that, in the management of a discourse, the principal care should be to produce thoughts that are pleasing and solid, although destitute of every ornament whatever, seeing that truth of itself, in what manner soever it appears, is at all times worthy of esteem, and, on the contrary, the most brilliant expressions, when destitute of solid thoughts, form but an idle jargon, that is absurd and contemptible : in short, that the orator should have some regard to the words, but his principal attention should be to the thoughts. The second rule is, that the thoughts should be simple, natural, clear, unaffected, and not laboured or forced,
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in order to make a parade of the understanding, but they should constantly arise from the subject itself, on which we treat, and should even appear inseparable from it, and so natural to it, that each one would imagine that that he should have thought and expressed himself on that subject exactly in the same manner.

XIII. Truth is the primary quality and the foundation of thoughts: these are the images of things, as words are the images of them: now, images cannot be true without having a strict resemblance to what they represent. Therefore a thought is either true or false, according as it makes a just or unjust representation of things; and it is more or less just, according as it corresponds more or less with the object it is to represent; as the habit does to the body. When it shines by a seeming resemblance only, it is mere tinsel. It is not sufficient, however, that a thought be strictly true; for by a mere regard to veracity it may become *trivial*. It should moreover be new or uncommon, and contain something that may affect or surprise. Truth never appears to so much advantage in a discourse, as when accompanied by elevated thoughts, such as fill the mind with grand ideas. It is by the sublimity of conception that the human mind is transported; but we should not always endeavour to transport. This elevation, this sublime, should be agreeable to the nature of the subject; and even the degree of elevation should correspond to the matter on which we treat.

XIV. Beside those thoughts which are *true, uncommon, and elevated*, there are others that are *noble and agreeable, pleasing, tender and graceful*, and which are often equally delightful with the sublime in a discourse. Sometimes the whole excellence of a thought consists in its *naivety*: and this naivety consists in a manner that is ingenuous and unaffected, but at the same time sprightly and sensible. There is a third species of thoughts which derive all their merit from *delicacy*: these form the most refined productions, the
flower

flower of the human mind ; but they are to be used with moderation, for nothing is more apt to cloy than the abuse or the continual use of delicate expressions. Besides these ingenious thoughts, the children of imagination, there are others that arise from *sentiment*, and where the affections appear to be more concerned than the understanding. Lastly, there is a species of thoughts that are called *brilliant*, whose whole merit consists in a mode of expression that is short, lively, and sententious ; that please by a pointed wit ; or that strike by a bold novelty, or an ingenious and uncommon turn : these brilliant thoughts form what may be literally called the essence and excellence of wit ; and it is by these that common thoughts are made to pass for more than they are really worth : a merit trifling enough ; an art unknown to the writers of the golden age, and which was introduced by Seneca in the decline of eloquence, revived and too frequently used, in our day, by all writers of mean abilities, even among those nations who esteem themselves as the most sensible in Europe : but they are examples that should be shunned like the plague, by every one who would acquire a sound eloquence, or not debase that which nature has given him.

XV. We are now come to the orator's second object, which is the *disposition* of his discourse. Every oration has four parts, which are, 1. The exordium : 2. The proposition : 3. The body of the discourse, and the manner of treating the subject (*tractatio*) : and, 4. The conclusion. In the exordium, an entire *chria*, which relates to the subject, is proposed ; or a short historical narration is given of facts relative to the matter that is going to be discussed. In the proposition, we may elucidate such terms as are either obscure or equivocal, and that cannot be omitted, and finish it by a short *captation of favour*. In the body of the oration, the several parts of it are treated successively, in their natural order, as so many particular *chrias* ; still giving the most attention to that which is the most important. Lastly, in the conclusion, we may briefly repeat the proposition ; and, if we think proper,

proper, the divisions and principal arguments. From the matter that has been treated, may be deduced consequences that are useful or doctrinal, moral or consolatory: or we may conclude our discourse by offering up vows for the welfare of our auditory.

XVI. *Elocution* is the orator's third capital object; and properly relates to the *style*. We have shewn in the 11th, 12th, 13th, and 14th sections, from whence we are to derive our thoughts or ideas: style is the method of representing those ideas. Cicero says, *rem verba sequuntur*; and it is a very common opinion, that finished expressions naturally arise from clear ideas, as Minerva issued completely armed from the brain of Jupiter: a poetic image, sententious expression; but too frequently false, or, at least, by no means a general truth. He who reads with attention, will very frequently find the contrary. What solid, what excellent thoughts do we not often meet with, that are either weakly or disagreeably expressed, in authors of profound ability and science, but to whom the Muses have refused the gift of elocution! How many writers are there also, who to render their works more generally useful, and that they may not be confined to one nation only, are induced to write in a language that is not natural to them, and of which they are by no means able masters? How many orators do we hear speak, for example, in Latin, a language which is not in the least natural to them; and which does not even furnish terms for all those objects that have been invented since the extinction of the Roman people, as well such as relate to dress and nutriment, as to the conveniencies and pleasures of life, and to a thousand ideas that arise from these objects! Even I, who was born on the banks of the Elbe, and now dwell in the rural and peaceful borders of the Pleisse, do not I at every instant prove the truth that is here asserted? Induced by a desire to be read by the polite world, and perhaps by foreigners, I have borrowed a French pen to trace my ideas on paper. The God of genius sometimes sends me rational thoughts, but the capricious Graces, who seem by a predilection to have

have fixed their abode on the French Parnassus, refuse me the power of expressing them. Indulgent reader, vouchsafe to pardon the wretched attire in which I am forced to present them to you! It is frequently mean and unfashionable: he, however, who is in love with truth, will be glad to meet with her, though she be half naked, or clothed in tatters.

XVII. But as, in general, it is according to the order of nature that external beauty and grace tend to make that esteemed and loved which is of itself good and true, the orator should apply with the utmost solicitude to the art of elocution; and in doing this there are four principal objects that he will keep in view, and which are, 1. the words, 2. the phrases, 3. the numbers, and the harmony that thence arise, and, 4. the connexion. The words should be *customary*, that is, generally received in the language in which we speak or write; *intelligible*, that is, clear and commonly used in the sense in which we employ them; and *well adapted* to the matter and place where they are applied. The phrases should have the same properties, and should be moreover polite, elegant, and agreeable. They should not be always studiously fought after. By practice they will be frequently brought to flow in abundance from the end of the pen. Neither should we be over difficult in our choice of them. Too much scrupulosity in this respect, says Quintilian, ends in a fruitless labour; an injudicious delicacy, which only tends to extinguish the fire of imagination. A judicious choice of epithets contributes also greatly to the elegance and to the strength of a discourse: they should not, however, be too frequently used; for, as the same author observes, it is with epithets in a discourse, as with valets in an army, who would only serve to overload it, if one was to be assigned to every soldier; as then the number would be doubled without doubling the force of the army.

XVIII. With regard to numbers and harmony, we may remark, that the arrangement of the words contributes greatly to the beauty and the strength of a discourse;

discourse ; that there is a natural taste in mankind which makes them sensible of numbers and cadence, and that it is scarce possible an expression should reach the heart which begins with shocking the ear. The numbers arise from the syllables that are short or acute, and accented or grave ; from the harsh or gentle sound of a word that is in itself rough or tender : but how harsh or rough soever a word may be, it may, by a happy transposition, be rendered soft and sonorous ; and of this we may be convinced by selecting some paragraph where the numbers and the periods are remarkably harmonious, and transposing the words and sentences. the same thoughts, and even the same expressions will remain, but the grace and harmony will totally vanish. Every ear, however, is not formed to distinguish this harmony with sufficient delicacy ; and to acquire a refined and just taste, it is necessary repeatedly to read with strict attention the works of the most able orators. On the other hand, we should be careful that we do not, by too much attention to the harmony of words and sentences, form regular verses, which is one of the greatest errors in composition. The late M. Patru wagered with a friend, that he did not find a single verse in all his prose writings : his friend took down the book of his admirable pleadings, opened it, and read the following title to one of his orations,

Septieme plaidoyer pour un jeune Allemand.

The seventh pleading for a young German.

M. Patru laughed, paid the bet, and was convinced, that an author must be extremely on his guard never to commit an inadvertency of the same kind.

XIX. Lastly, with regard to connexion, it is sufficient to observe, that the matters on which we treat, the propositions that we advance, and the periods that we compose, should not only have a natural connexion among themselves, and be so disposed, that the succeeding part may be the immediate consequence of that which precedes ; but we should also know how to join the propositions and periods with grace
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and propriety, by the means of particles that are just and agreeable.

XX. As to what concerns the different sorts of style, the rhetors have here made many pedantic and trifling divisions. They distinguish between a style that is homiletical, juridical, medicinal, philosophic, historic, oratorical, epistolary, comic, poetic, and I know not how many others. They observe and explain the difference between styles that are humble, moderate, sublime, simple, subtile (*argutus*), decent, polite, satiric, familiar, ceremonious, joyous, serious, narrative, relative, prolix, and concise. When we have said that each art and science has its jargon, that there are certain technical terms which are essential to it, and which should be used with propriety and moderation, and that we should constantly adapt the expressions and the style to the matter on which we treat, we think we have said in a few words all that can be said on the subject, and that common sense is sufficient to dictate the rest.

XXI. The *peroration* is the orator's fourth and last object. It is the manner of speaking the oration or discourse that he has composed: and consists of three articles, 1. *memory*, 2. *pronunciation*, and, 3. *action*. In order to assist his memory, the orator should make a regular disposition in his discourse, and mark the several parts in the margin; he should write his oration distinctly and regularly, and underline the principal connexions; and lastly, he will do well to accustom himself to speak sometimes extempore, that he may be able to proceed in case of necessity. With respect to pronunciation, he should take care that it be distinct, and should endeavour to acquire a tone of voice that is sonorous and graceful; he should modulate his voice; know how to rise or fall, strengthen or weaken it, as the subject may require, and accompany each word with that inflexion which is peculiar to it. Lastly, with regard to action, he should keep his body erect, the head raised, the limbs in a decent and easy attitude, and his countenance should express what his words import, the hands should sometimes concur in
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the expression, and sometimes remain unmoved. In a word, the orator should be equally careful not to resemble a mimical harlequin, or a speaking statue, an immovable oracle. We shall treat more largely on these three points in the chapter on declamation.

XXII. Thus we think we have given a general sketch of the art of oratory, or of the precepts of eloquence. No one is more fully convinced, than we are, of that incontestable truth, that the study of the great models, and particularly of the ancients, is one of the most efficacious means of forming a great master in all the liberal arts, and especially a finished orator. We here lay down this truth as a precept. But we do not think, that this is the *only* or even the *first* method that should be made use of to attain this art. This study should be preceded by a regular and solid theory. Notwithstanding the respect we entertain for the memory of the late M. Rollin, we cannot avoid saying in this place, that whoever imagines his treatise contains a just and certain method of teaching and studying the Belles Lettres, is very far wide of the truth. That method, on the contrary, is the most deceitful that can possibly be adopted, as it is only capable of forming servile imitators; who, making choice of models they know not why, and blindly pursuing them, obtain their end, or wander from it, they know not how. We cannot, moreover, suffer our reason to be so far subjected by general prejudice, as to think that the ancients understood the theory of the polite arts equally well with the moderns. The human mind must have successively improved them by the new discoveries during so many ages. How long shall we suffer ourselves to be dazzled by a few fine models of antiquity? Among all the authors of so many ages, time has selected, and transmitted to us, but a very small number of such as are excellent; and these owe very much of their merit to genius, and very little to art; as a proof of which, we frequently find in their productions a strong mixture of good and bad; the most sublime strokes of genius, in the midst of the darkest ignorance. M. Burmann, in the preface

face to his edition of Quintilian, assures us, that the theory of eloquence is carried by that author to its highest perfection. But he deceives himself; and we see whole nations, like him, deceive themselves, by attributing all to genius, regarding art as superfluous, and being ignorant, like that learned writer, to what degree the moderns have extended the theory of this art. Besides, the mark of imperfection and mediocrity, which constantly accompany the commencement of arts, are imprinted, here and there, in all the works that are left us of antiquity. When the ancients excelled, it was almost entirely the effect of genius. They were sensible, indeed, of the uncertainty of this method, and it was for that reason that they invented this art; but they have not carried it to its utmost extent, to the highest degree of excellence: the moderns have advanced far beyond them, and posterity will doubtless still add to the degree of its perfection. We deceive ourselves not so frequently as they did by running into the extravagant, the false sublime, &c. and yet we are not always free from these errors. Let us therefore study the works of the ancients, but let us know why we do it, and let us do it without prepossession: and while we exert our abilities to discover all their beauties, let us have sufficient resolution, discernment, and ingenuity, to criticise all their defects.

XXIII. We shall now say a few words on the different species of harangues, or public orations, that we have comprised in the third section, under the genus of political eloquence. The first sort is that of the *bar*. The tribunals are not formed among all people, and in all states, on the same model. In some courts written pleadings are made use of, in others such only as are verbal. The latter kind admits of an eloquence more sublime and more florid than the former. Our ancestors strewed over their pleadings the flowers of rhetoric with bounteous hands: but this false taste is now banished, and the celebrated Patru has given the true model of the eloquence of the bar, by employing a style that is the
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most nervous and most correct; a diction the most noble of which we have hitherto had any example. At this day, the man of the law is to remember, that a pleading, whether it be verbal or written, is a species of oratory that is demonstrative and persuasive; that he should prove, persuade, and even sometimes seduce; that in the two former cases, force of argument, and a noble simplicity, will enable him to attain his end; and in the latter, the great art consists in concealing the seduction, and in presenting the specious under the external figure of the truth.

XXIV. The *academic* eloquence is employed, 1. In declamations or oratorical discourses, and in the prologues and epilogues to dramatic pieces that are represented by the students; 2. In solemn harangues; 3. In panegyrics; 4. In *allocutions* or compliments addressed to distinguished personages; 5. In the invitations to some solemn act; 6. In *prælections* or dogmatic discourses which the masters or professors make in their sciences; 7. In disputations; and, 8. In the *programmas*, or public informations of college exercises. As the orator has here the choice of his theme, and the manner of composing it, he may follow the precepts that have been given for eloquence in general; constantly remembering that this species of elocution admits of a very elevated style, of all the flowers, and every possible ornament of rhetoric: for the sole intention of such compositions is to please and surprise, and to shew the powers of the art.

XXV. Political eloquence, properly so called, is practised at the court, or in councils of the citizens, in the senate, or in general assemblies of the people; in compliments addressed in the name of the prince to other sovereigns, in nuptial or funeral ceremonies, in the reception of ambassadors, in diets, elections, congresses, and on many other similar occasions. In these kinds of discourses the sublime would be ridiculous, and is therefore to be studiously avoided. The least traces of art should never appear on these occasions, and much less pedantry. A regular exordium and introduction are totally proscribed. The orator passes
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from the proposition directly to the matter itself of which he intends to treat. But, on the other hand, too much attention cannot be given to the strength and beauty of the elocution, as well as to the choice of expressions; which should be clear, strong, noble, elegant, polite, and all in the highest degree.

XXVI. The eloquence of public ministers requires still more simplicity, and therefore admits of still less ornament. All depends here on the choice of words and phrases. They should express and persuade without appearing to make the least pretension to eloquence. Ambiguity is the more especially to be avoided, as the most dangerous consequences may be the result. The more concise, energetic, and elegant, the more excellent these sorts of compliments and discourses are. A due observance of titles is above all things necessary; and the peroration is here an essential article. The ambassador should be a perfect master of his discourse, and pronounce it with grace and fluency; not mutter it in an unintelligible tone, or pronounce it aloud like a common cryer.

XXVII. A noble simplicity, perspicuity, and energy, compose the excellence of that eloquence which should be found in those public writings which proceed from sovereign authority. The flowers of rhetoric are here at once unnecessary and disagreeable. The sovereign power, if it do not constantly talk in an imperative tone, should at least preserve a dignity that is consentaneous to its rank. It should not moreover affect too much concision: the matter is constantly worth the words and phrases that are necessary to express it. The periods should be smooth and harmonious; but they should not conclude with sententious expressions, and still less with antitheses or epigrammatic points; for that of all tastes is the worst.

XXVIII. To conclude, we might write an entire treatise on the various degrees of eloquence that should be found in different writings, and on the different style that each matter requires. But this is a subject we must leave to the talents, to the judgment, and

taste of the writer ; only observing in general, that he should constantly adapt his style to the nature of the subject on which he treats ; as when he writes on chymistry, for example, not to make use of those similes, allegories, epigrammatic turns, and sententious expressions, which are the ornaments of a romance, and compose the essence of a poetic style. There is at present, indeed, a vicious taste diffused over Europe, and especially among the Southern nations : but its duration will not be long, nor its progress dangerous. We now see every where a profusion of flowers : roses and jessamines supply the place of fruit. Nothing is now esteemed but the gifts of Flora : those of Ceres, Bacchus, and Pomona, are disregarded. When a new work now appears, the question constantly is, *Is it well wrote ?* The question, however, should be, *Does it contain solid matter ?*

C H A P. V.

SACRED ELOQUENCE, OF THE HOMILY.

I. **T**HE term *homily*, or the homiletic art, has been given to sacred eloquence, to distinguish it from that which is made use of by secular orators, in their harangues or set discourses. The word *homily* is Greek, and signified originally an assembly or conference ; but was afterwards applied to exhortations or sermons addressed to the people assembled in the Christian churches. In the first ages, the bishops only were permitted to preach : that permission was not given to priests till toward the fifth century. St. Chrysostom was the first of the order who exercised that function. Origen and St. Augustin, indeed, preached as priests, but it was by a particular privilege.

II. In treating on the homily we are therefore to observe,

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1. That the sacred orator harangues both in the pulpit, and on divers other occasions.
2. *What* he says, and *how* he says it ; that is, the nature of the subjects, and the manner in which they are treated : or, in other words, that he speak either *learnedly* or *eloquently*.

These are the objects to which homiletic theology relates, and for which it furnishes precepts. Whether the orator speak in or out of the pulpit, he should propose important truths, and in a manner that may *instruct, convince, please, and affect*. This is the primary, the general rule of the homiletic art. Let us now descend to some particulars.

III. When the preacher declaims from the pulpit, he does it either from a certain text of his own selecting, or from one that is prescribed by the church ; as from the gospels and epistles for the day, the texts for the feasts or holidays, the days of fasting and humiliation, &c. The church seems to have erred in confining its preachers to certain texts, as well as in the pitiful choice it has made of them. For, in the first place, it is putting it out of the power of an able theologian to explain to his flock all the principal dogmas of their religion, unless he will introduce matters that are quite foreign to his text : in the next place, it is to accustom preachers to indolence, and to furnish them with the means of becoming plagiarists, by pillaging from the numberless sermons that have been made on the Evangelists : thirdly, it is the means of preventing them from ever preaching on the creation, the decalogue, on the mercies that God bestowed on the people of Israel, on the prophecies, and from an infinity of admirable texts that might be drawn from the Old Testament : fourthly, we ought not, in general, to give fetters to the athletic, nor oblige those who are capable of walking with a firm step to make use of a crutch. It is true, that the sermons, preached on the dogmas or theses in explaining the catechisms, remedy these inconveniences in some degree ; but, were it convenient to dwell longer

on this article, we could easily shew how imperfect such remedy is.

IV. The text being chosen or given, the preacher should begin by making a triple analysis. 1. A grammatical analysis, or an explication of the words, the construction, the phrases, and the idiotisms: 2. A rhetorical analysis, in which he should consider the tropes, the figures, and the oratorical construction: and, 3. A logical analysis, wherein he should examine the principal proposition contained in the text, extract it, explain the subject, its attributes and connexions; and from whence he should, lastly, deduce such arguments as are capable of elucidating, enforcing, and proving the proposition.

V. Texts are of various genus and species; among which are five that are reckoned principal; which are, First, the *didactic*, which treats of an article of faith, of a fact, or of an object, of the nature of a virtue or vice, &c. The species of this genus are, 1. an historical recital, 2. an affirmation, 3. a testimony, 4. approbation, 5. a description, 6. a prophecy. Second, the *elenctic* genus, which treats of an object in contestation: the species of which are, 1. a disputation or controversy, 2. a refutation, 3. a reproach on an error, 4. an accusation of error, and, 5. sometimes even an imprecation against that error. Third, the *pædæutic* genus, which regards the practice of the Christian virtues: the species of which are, 1. an exhortation, 2. an injunction or command, 3. a prayer, 4. a wish or vow, 5. a recommendation. Fourth, the *epanorthetic*, which describes the vices that the Christian ought to avoid: the species of which are, 1. a dehortation: 2. a defence, 3. a reproach of vice, 4. a menace, 5. a punishment foretold, or a chastisement declared, 6. an imprecation or malediction. Fifth, the *consolatory* genus, which treats of some scourge of Heaven, or some private affliction: the species of which are, 1. a deploration, 2. a commiseration, 3. a consolation, or promise of succour, 4. the efficacy of relief, 5. a prayer for the afflicted.

afflicted, and that they may be relieved from their calamities.

VI. When the text is selected, and when a succinct analysis is made of it, when its genus and species are explained, and when a judicious proposition is drawn from it, the preacher proceeds to the division of his discourse, in which he has also to consider, 1. the exordium, 2. the proposition, 3. the method of dividing it, 4. the tractation, or method of treating it, 5. the application, and, 6. the inferences that may be drawn from it. We think we should here make a general remark, which relates as well to all that we have said, as to all that we shall say on this subject; which is, that the sacred orator is not obliged servilely to follow the chain of all these rules, though he ought not to be ignorant of any one of them. His natural talents, the vivacity of his genius, the strength of his judgment, the sagacity of his discernment, the force of his memory, his practice, or experience, will all concur to enable him frequently to find all these objects, so to speak, with a single glance of his eye. He should even avoid all appearance of the traces of art, or, if you please, the pedantism of the homily in his sermon. In treating on eloquence in general, we have polished and prepared, in the preceding chapters, all the materials that are necessary for composing and properly expressing an oratorical discourse. We shall therefore refer the reader to those parts, that we may not fatigue him with disagreeable repetitions.

VII. The homiletic art enters here into a large detail, in order to shew the method of contriving the exordium and proposition, the method of making divisions, of drawing ingenious consequences in order to form an application, &c. It describes, on this occasion, four different methods, which are, the *analytic*, the *synthetic*, the *schematic*, and the *arbitrary*, of which it gives the definitions, the rules, and examples; and which must be learned by the study of the art itself.

VIII. With regard to *tractation*, which forms what may be called the body or essence of a sermon, we think we should observe here, that it rests entirely on the arguments which the sacred orator employs to prove his thesis and propositions. The arguments are of different kinds, and tend either to explain, to prove, to enforce, to amplify, or to affect. They are drawn either from the etymology, the homonymy, or synonymy of words; from the definition or description, the paraphrase, the different opinions, the defence of the text, the manner of reconciling passages seemingly contradictory, the comparison of versions with the original text, the parallel passages, the context, or that which precedes, and that which follows; from the express and formal assertion of the Holy Scriptures; from just consequences; from that which is possible and agreeable; from the reverence due to the Supreme Being, and the idea which we ought to entertain of his divine perfections; from the confessions even of adversaries; from the analogy of faith; from the utility or prejudice that will be the result; from the examples of the upright or the reprobate, the just or the unjust; from the mercy of God, the merit and intercession of Jesus Christ, the assistance of the Holy Spirit, the divine providence; from the ordinary lot of the faithful; from the example of our Saviour, his apostles, and the saints; from the necessity, the utility, and short duration of the cross; from the goodness of the cause; from the divine assistance; from the omnipotence, omnipresence, omniscience, and infinite mercy of God; from eternal rewards and punishments, &c. From these sources the preacher should endeavour to draw, by exerting all the powers of the human mind, such arguments as are striking and conclusive, and apply them, with the utmost sagacity, to the genus and species of his text, or the matter on which he treats.

IX. The application should be pertinent, and flow naturally from the text, and the propositions which
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the orator has thence deduced ; for these consequences should never be forced. The preacher should exert all his art to render it animated, persuasive, and affecting. He may there employ, but with moderation, the most brilliant figures of rhetoric ; and these will contrast right well with that great simplicity, perspicuity, and force, which he has made use of in the arguments that compose the body of his sermon. The application ought not likewise to be very long, any more than the exordium : moreover, it should terminate the whole discourse, and finish with a period that is lively, striking, energetic, and affecting ; that contains in a manner the whole matter of the sermon, and that is capable of making a sudden impression, and of fixing deep traces in the minds of the auditors.

X. It is easy to conceive, that all the homiletic art will be frivolous and useless, if the preacher, by the aid of the dogmatic, exegetic, polemic, and moral theology, have not acquired a thorough knowledge of the religion he professes, in its full universality. His mind should contain a copious fund of erudition, from whence he may draw, on every occasion, the most striking thoughts, and most solid arguments. His style should not be remarkably florid or pompous, and much less mean and groveling. The most solid and necessary aliments have still need of seasoning to make them agreeable. Such is the nature of man. The due arrangement of the matter of a discourse contributes, more than is commonly imagined, to render the truths it contains perspicuous, persuasive, convincing, and affecting ; and art, which is founded on experience, furnishes such rules for this purpose as are drawn from the works of the most able orators. We have happily, in all the Christian communions, excellent models of this kind, which the young theologian should read and study with the utmost attention. St. Augustin, Bourdaloue, Bossuet, Marillon, Flechier, Tillotson, Taylor, Stillingfleet, Saurin, Jaquelot, Mosheim, Cranmer, Jerusalem, and many other admirable preachers, are so many re-

fulgent lights that guide the student in his career; and though every one, who devotes himself to the altar, cannot hope to attain a degree of excellence equally sublime with those finished models, they ought, however, constantly to aspire after it, and exert the most glorious efforts in endeavouring to resemble them.

XI. The sacred orator has great advantages over all others: 1. As the matters he proposes are interesting to all mankind, of every rank and profession, sex, age, and condition in life: 2. As these matters are of the highest importance to the whole human race, seeing that on them their temporal and eternal happiness depends: 3. As all Christian discourses are founded on the Holy Scriptures, which are the object of veneration of all faithful believers throughout the whole Christian world: 4. As they may employ the passages of Holy Scripture in support of their arguments, and use them as proofs; and as these passages, with all others that are parallel, are so easy to be found by the aid of a good *concordance verbal and real* *: and lastly, the style of the Scripture itself is in the highest degree nervous, pathetic, and sublime; so that whoever shall make a proper use of it, by judiciously uniting it with common eloquence, cannot fail to please and to affect. This remark is so evidently true, that it is only necessary, in order to be fully convinced of it, to observe the happy effect in the use which M. Racine has made of it in his Christian tragedies of Esther and Athalia, especially the latter: the merit in this piece consists, in my opinion, not so much in the plan, the subject, the incidents, and the catastrophe, as in the dialogue; where that illustrious author has found means to introduce, in a manner most wonderfully happy, the most beau-

* A sort of Bible so called, where, by the indefatigable labours of some learned theologians, there are marked on the margin of the text, all the parallel passages to that we see, which are to be found in the Old and New Testament, as well for the words and phrases, as for the facts and doctrines.

tiful expressions in the Old Testament ; which, being so judiciously inserted, produce a surprising effect, and elevate the mind, so to say, above its natural sphere. The preacher, however, should use these advantages with moderation ; for, by an excessive use, the most excellent things become at length insipid. He should take particular care not to corrupt his style with hebraisms, which is a fault that is very natural in the practice of sacred eloquence. These hebraisms very frequently seduce prophane writers *. Exaggerations, gigantic figures allusions to objects that are mean and wretched, thoughts that exceed the bounds of nature, forced turns of expression ; in a word, the turgid style of the Hebrews appears to many modern poets as the utmost height of sublimity ; an error which cannot be too much decried, as it is of the most dangerous consequence.

XII. With regard to the peroration of a sacred discourse, we shall only remark here (beside what we have said in the preceding chapter on eloquence in general, and what we shall hereafter say in treating on declamation) that custom requires, almost universally, that the preacher deliver the sermon he has composed *memoriter* ; or that he preach merely from meditation. It is only among the English, a people accustomed to deliberate consideration on all subjects, and to a minute examination of every article, where it is permitted to read a sermon : and they do it because, 1. every preacher is obliged to preserve the minutes of his discourse, that he may prove that he has preached nothing contrary to the dogmas of the church : 2. because a minister, obliged to preach once or twice a week, may employ that time in polishing his discourse, which he must have employed in retaining it in his memory : 3. because a preacher may, and always ought to mistrust his memory, which must make him

* Our author must be understood to speak here of the apocryphal and other Hebrew writers, who are remarkable for an ostentatious style ; very different from the noble simplicity of the sacred writers.

timid and embarrassed, and must consequently affect his declamation: 4. they regard the efforts, which are necessarily made to remember a discourse, as puerile and unworthy of a man of sagacity; as he may recite it with grace and propriety, and affect all rational minds equally well when he has his notes before him, as when he speaks *memoriter*: 5. sermons, that are preached merely from meditation, are almost always flat and uninteresting; and as the speaker is obliged to make use of the first thoughts and first words that offer themselves to his mind, and has not time for consideration, expressions that are improper, mean, vulgar, trivial, redundant, &c. cannot fail to slip into his discourse. Moreover, the general simplicity of the first ages being banished from the world, the simplicity of the first itinerant preachers must appear to the Christians of our days quite insipid and unedifying, not to say ridiculous; like that of the Quakers, who, preaching by inspiration, while they enrap their enthusiastic brethren, stupify all rational hearers.

XIII. We have observed, in sect. 2. that occasions frequently occur where the minister of the gospel is to harangue out of the pulpit; and these occasions are in particular,

1. At the foot of the altar, when he unites two persons in the holy bonds of matrimony, and gives them the nuptial benediction.
2. When he is called to assist at a solemn espousal, and pronounces, on that occasion, an edifying exhortation.
3. When he assists at the ordination of a priest, and imposes his hands, or introduces him to his new cure, to his parish, and the functions of his charge.
4. At baptism, where he inculcates to the sponsors their duty, and gives his benediction to the child.
5. At the confessional, where the confessor rouses the conscience of his penitent, encourages the timorous, terrifies the profligate, or comforts the afflicted soul.

6. In

6. In consistorial assemblies, where it is sometimes of importance to gain an ascendancy over the minds and the determinations of the auditors by a victorious eloquence.
7. In prisons, where he is to prevail on criminals to make confession of their crimes, and to repent.
8. At public executions, where justice sacrifices unfortunate sinners to the public security, and where he should prepare them for a Christian death, or at least to take care that they behave with external decency.
9. At the bedside of the sick and dying, to whom he should communicate every consolation of which their condition is susceptible, and confirm them in the hopes of a blessed immortality.
10. With those who are afflicted in mind, or in a desponding state, or tormented with the anguish of a guilty conscience.
11. With families labouring under misfortunes, or distracted by intestine broils and dissensions.
12. In times of public calamity, such as a plague, famine, &c. where the whole people stand in need of consolation.

As it is necessary that a sermon should be laboured, corrected, polished, wrote word by word, so it is necessary on all these, and numberless other occasions, that the discourse should be simple, natural, unstudied, and spring, so to say, from the bottom of the heart; for it is the heart that here must speak to the heart. Irregularity, a natural neglect of order, affects here far more, carries with it a persuasion infinitely more powerful than the most exact arrangement of art; and for this reason it is, that the minister of the gospel should habituate himself to think and speak at all times in a methodical manner, and to acquire a natural eloquence, capable of pleasing, persuading, and affecting, on every emergent occasion.

XIV. Lastly, there is a species of harangue, or public discourse, which we may refer to the mixt kind, such as funeral orations, panegyrics on great and good men,

men, epithalamiums, dedications, &c. All these sorts of discourses are to be composed in conformity to the general rules of eloquence, and they admit of being highly ornamented. Funeral orations commonly consist of four parts, which are, the eulogy of the deceased, the bewailing of his death, the consolation to be administered to those who deplore his loss, and the acknowledgments to be made to those who attend his funeral. The orator will not fail to remember, on these occasions, those general precepts which grammar, rhetoric, and eloquence afford, and which are constantly to be exercised in all public orations.



C H A P. VI.

P O E T R Y.

I. **M**AJESTIC Reason! I implore thine aid. It is for thee to give laws to an animated, amiable, enchanting people; but who do not at all times acknowledge thy empire: an idolatrous people, who sacrifice to Apollo and invoke the Muses. Enlighten my understanding, and guide my pen. Teach me to trace the most rigid precepts of an art that is most free: but deign sometimes to relax thy rigorous severity, in favour of the happy deviations of genius, of those whom I seek to guide.

II. We shall not busy ourselves here with searching into the origin of this nation, which is spread over the face of the whole earth. The poets have ever felt the envious persecutions of fortune; that blind goddess being unwilling that one part of mankind should be more enlightened than the rest: the poets, I say, are all of one ancient and illustrious family, whose first parent was the God of genius himself. Amidst those thick clouds which envelope the first ages of the world, reason and history throw some lights

lights on their origin, and the primitive employment of their divine art. Reason tells us, that, before the invention of letters, all the people of the earth had no other method of transmitting to their descendants the principles of their worship, their religious ceremonies, their laws, and the renowned actions of their sages and heroes, than by poetry; which included all these objects in a kind of hymns that fathers sung to their children, in order to engrave them with indelible strokes in their hearts. History not only informs us, that Moses and Miriam, the first authors that are known to mankind, sung, on the borders of the Red Sea, a song of divine praise, to celebrate the deliverance which the Almighty had vouchsafed to the people of Israel, by opening a passage to them through the waters, but it has also transmitted to us the song itself, which is at once the most ancient monument, and a master-piece of poetic composition.

III. The Greeks, a people the most ingenious, the most animated, and, in every sense, the most accomplished, but at the same time the most ambitious, that the world ever produced—the Greeks strove to ravish from the Hebrews the precious gift of poetry, which was vouchsafed them by the Supreme Author of all nature, that they might ascribe it to their false deities. According to their ingenious fictions, Apollo became the god of poetry, and dwelt on the hills of Phocis, Parnassus and Helicon, whose feet were washed by the waters of Hyppocrene, of which each mortal that ever drank was seized with a sacred delirium. The immortal swans floated on its waves. Apollo was accompanied by the Muses—those nine learned sisters—the daughters of Memory: and he was constantly attended by the Graces. Pegasus, his winged courser, transported him with a rapid flight into all the regions of the universe. Happy emblems! by which we at this day embellish our poetry, as no one has ever yet been able to invent more brilliant images.

IV. The literary annals of all nations afford vestiges of poetry, from the remotest ages. They are found
among

among the most savage of the ancient barbarians, and the most desolate of all the Americans. Nature asserts her rights in every country, and every age. Tacitus mentions the verses and the hymns of the Germans, at the time when that rough people yet inhabited the woods, and while their manners were still savage. The first inhabitants of Runnia, and the other northern countries, those of Gaul, Albion, Iberia, Ausonia, and other nations of Europe, had their poetry, as well as the ancient people of Asia, and of the known borders of Africa. But the simple productions of nature have constantly something unformed, rough, and savage. The divine wisdom appears to have placed the ingenious and polished part of mankind on the earth, in order to refine that which comes from her bosom rude and imperfect: and thus art has polished poetry, which issued quite naked and savage from the first of mankind. This art still labours, and will ever find fresh objects to engage its attention. It is this art whose principles we must here investigate, and of which we shall point out the principal rules. Severe reason, do not abandon us in this rugged path! Enlighten us with thy torch, and guide our pen! Teach us that style which is proper in the search of truth! But permit us sometimes to adorn this truth, simple and natural, with a garland formed by the hands of the Muses; seeing that we write for those who are accustomed to resplendent images, and habituated not to take the most salutary remedies, but in a vehicle that is poignant and grateful to the taste.

V. But what is poetry? It would be to abridge the limits of the poetic empire, to contract the sphere of this divine art, should we say, in imitation of all the dictionaries and other treatises on versification, that *poetry is the art of making verses, of lines or periods that are in rhyme or metre*. This is rather a grammatical explanation of the word, than a real definition of the thing, and it would be to degrade poetry thus to define it: for this would present the idea of an art, that has scarce more merit than there

is in the dexterity of throwing the grains of millet through the eye of a needle. Let us, therefore, form a more noble and more rational idea, and let us say, that *poetry is the art of expressing our thoughts by fiction*. The German terms *, by which we render the word poetry, and the art of making it, correspond exactly with this definition; while the Greek verb ποιέω, and the substantive ποίησις, the first of which signifies *to make*, and the other *a work*, does not throw any etymological light on the matter itself, though these words have been adopted in the Latin language, and in all those that are derived from it.

VI. It is therefore after this manner (if we reflect with attention) that all the metaphors and allegories, that all the various kinds of fiction, form the first materials of a poetic edifice: it is thus that all images, all comparisons, illusions, and figures, especially those which personify moral subjects, as virtues and vices, concur to the decorating of such a structure. A work, therefore, that is filled with invention, that incessantly presents images which render the reader attentive and affected, where the author gives interesting sentiments to every thing that he makes speak, and where he makes speak by sensible figures, all those objects which would affect the mind when clothed in a simple prosaic style, such a work is a poem. While that, though it be in verse, which is of a didactic, dogmatic, or moral nature, and where the objects are presented in a manner quite simple, without fiction, without images or ornaments, cannot be called poetry, but merely a work in verse: for the art of reducing thoughts, maxims, and periods into rhyme or metre, is very different from the art of poetry.

VII. An ingenious fable, a romance that is short and full of vivacity, a comedy, the sublime narrative of the actions of a hero, such as the Telamachus of M. Fenelon, though wrote in prose, but in measured prose, is therefore a work of poetry: because the

* DICHTRUNST, *the art of fiction*, and DICHTEN, *to make fictions* signify poetry, and making of verses.

foundation and the superstructure are the productions of genius, as the whole proceeds from fiction ; and truth itself appears to have employed an innocent and agreeable deception to instruct with efficacy. This is so true, that the pencil also, in order to please and affect, has recourse to fiction ; and this part of painting is called the *poetic* composition of a picture, as we shall see hereafter. It is, therefore, by the aid of fiction that poetry, so to speak, paints its expressions, that it gives a body and a mind to its thoughts, that it animates and exalts that which would otherwise have remained arid and insensible. Every work, therefore, where the thoughts are expressed by fictions or images, is poetic ; and every work where they are expressed naturally, simply, and without ornament, although it be in verse, is prosaic. The difference, therefore, between verse and prose, is perhaps not so great as between poetry and prose ; for we frequently see prosaic verses, but never prosaic poetry, for that would imply a contradiction. Let such as reject our definition, or that are of a contrary sentiment to what we have here advanced, or that attribute to mere versification, prerogatives to which it can have no pretension, tell us to what class of diction or writing they would refer those works we just now mentioned, those fables, romances, comedies, poems, where the invention and the style are equally poetic. If they place them among the number of writings that are merely prosaic, they are far wide of the truth. Arts and sciences have been reduced into systems, merely to establish more order in their several divisions ; to abridge the labour of the memory and discernment, by ranging each matter in its proper place ; and in this arrangement no other place can be found for these kind of works, the children of genius and of fiction, than in the sanctuary of poetry.

VIII. Let it not be imagined, however, that we regard verse as foreign or superfluous to poetry : certainly not. We are very far from entertaining so gross an error ! To reduce these images, these fictions into
verse,

verse, is one of the greatest difficulties in poetry, and one of the greatest merits in a poem: and for these reasons; the cadence, the harmony of sounds, and still more, that of rhyme, delight the ear to a high degree, and the mind insensibly repeats them while the eye reads them. There results, therefore, a pleasure to the mind, and a strong attachment to these ornaments: but this pleasure would be frivolous, and even childish, if it were not attended by a real utility. Verses were invented in the first ages of the world, merely to aid and to strengthen the memory: for cadence, harmony, and especially rhyme, afford the greatest assistance to the memory that art can invent. It is impossible in verse, that the periods can become tedious, for the poet is obliged, whatever may be his inclination, to concenter his ideas, and include each thought in a certain given number of syllables. From whence it arises, that each thought becomes of itself a sentence, under the pen of a good poet; and the images or poetic fictions that strike our senses, assist in graving them with such deep traces in our minds, as even time itself frequently cannot efface. Montagne, who is always singular in his expressions, says somewhere, *La sentence pressée aux pieds nombreux de la poésie, élance mon ame d'une plus vive secousse.* A sentence, that comes running on the numerous feet of poetry, rouses my mind with a more hearty jolt. How many excellent apothegms, sentences, maxims, and precepts would have been buried in the abyss of oblivion, if poetry had not preserved them by its harmony? To give more efficacy to this lively impression, the first poets sung their verses, and the words and phrases must necessarily have been reduced, at least to cadence, or they could not have been susceptible of musical expression. One of the greatest excellencies of poetry consists, therefore, in its being expressed in verse; from whence it follows, that it has two parts, the first of which relates to *invention* in general, and is called, by way of excellence, *poetry*; and the other, which relates to the *execution*, is called *versification*.

IX. This

IX. This natural and just division we propose, therefore, to observe in the following analysis; and that in two chapters. In the first we shall exert all our efforts to investigate and to establish the true principles of the poetic art; and in the second, shall explain the precepts and the rules of versification. But previous to entering on this difficult career, and where we must expect to meet with thorns as well as flowers, it is proper to refer the reader to the first chapter of this second book, where we began to trace those general precepts which are common to all the polite arts. The following reflections will serve principally to apply them to the great art of poetry in particular, and at the same time to shew that they are just.

X. We have said in the first chapter, that the essence of the polite arts in general, and consequently of poetry in particular, consists in *expression*: and we think that to be poetic, the expression must necessarily arise from *fiction*. It follows, therefore, that the first principles of poetry must be *invention* (see chap. 1. sect. 7.) This invention, which is the fruit of happy genius alone, arises, 1. *From the subject itself, of which we undertake to treat*: 2. *From the manner in which we treat that subject, or the species of writing of which we make use*: 3. *From the plan that we propose to follow in conformity to this manner*: and, 4. *From the method of executing this plan in its full detail*. Our first guides, the ancients, afford us no lights that can elucidate all these objects in general. The precepts, which Aristotle lays down, relate to epic and dramatic poetry only: and which, by the way, confirms our idea, that antiquity itself made the essence of poetry to consist in fiction, and not in that species of verse which is destitute of it, or in that which is not capable of it. But since this art has arrived to a great degree of perfection, and as poetry, like electricity, communicates its fire to every thing it touches, and animates and embellishes whatever it treats, there seems to be no subject in the universe to which poetry cannot be applied, and that it cannot
render

render equally brilliant and pleasing. When the god of genius fixed his abode on the summit of the forked hill of Sans-fouci, he described the rough art of war with as much elegance and grace as he would the gentle art of love, were he to make that the subject of his song. From this universality of poetry, from its peculiar property of expressing by fiction, which is applicable to all subjects, have arose its different species, of which we must not here omit the description, as well as marking their limits, and tracing the principles which are peculiar to each particular class.

XI. The first is the epic or *epopee*. Of this the judicious Despreaux has given us a beautiful description in these verses of his Art of Poetry :

D'un air plus grand encor la *poésie épique*
 Dans le vaste récit d'une longue action
 Se soutient par la fable, & vit de fiction, &c.

The *epic poem* claims a loftier strain.
 In the narration of some great design,
 Invention, art, and fable, all must join, &c.

SOAMES.

This great poet learned from Horace, his master and his model, what were the true criterions of good and bad poetry of every kind. The rules he has given are just ; and what is most admirable, the manner in which he expresses the rule, commonly affords the most finished example that can possibly be produced. He has not, however, exhausted this art ; his poeticks do not near contain all that is essential, nor all that ought to be said on poetry, when we would rather instruct than please. He resembles some wealthy husbandman who roves through the vallies, and amuses himself with cropping the most beautiful flowers, leaving to others the labour of the harvest. The word *epic* is derived from the Greek *επος*, which comes from the verb *ειπω*, *dico*, and signifies, in a natural sense, *discourse*, and in a figurative sense, *a discourse in verse*, or *piece of poetry*. The word *epopee* is also Greek, and comes from *επος*, *carmen*, a *poem*, and from *ποιω*, *facio*, *I make*. Custom, as well ancient

as modern, has consecrated the name *epic*, by way of excellence, to a grand poem that is not dramatic ; and by the *epopee* is meant the history, fable, or subject of which such poem treats. An epic poem, therefore, is now the *recital*, either in verse (which is the most perfect kind) or in a poetic style, *of an event that is uncommon, grand, worthy of admiration, and at the same time interesting, either to mankind in general, or to a great number of them in particular.*

XII. Whether it be from the perversity of the human heart, from the weakness of the understanding, or from custom, mankind seem to be habituated to regard those things only as grand, wonderful, and interesting, which tend to their destruction, that is, the actions of renowned warriors. Our history, called civil or politic, consists merely, if we consider it attentively, of a number of relations of wars that have desolated the earth under various sovereigns. Poetry has been made to follow the same prejudice : from whence it comes, that the title heroic poem is given, though very improperly, to an epic poem ; and we even have not, in the German language, any other term whereby to express it. Men have suffered themselves to be so far deceived by this denomination, as to imagine that the subject of an epic poem can be founded only on the actions of some hero. An extravagant error, a ridiculous and dangerous abuse of words, and a striking instance of the caprice of pedants ! Is there then nothing but that which is the cause of the misery of mankind that deserves to be transmitted to posterity, and made the subject of poetry ? Those great events on which their happiness is founded, and from whence all their felicity has arose, are these unworthy to bear the name or enter into the composition of an epic poem ? Because Homer and Virgil have made their poems consist of the actions of the destroyers of mankind, of heroes, and, what is more, of mean and wretched heroes, is it not permissible to introduce the peaceful benefactors of the human race, men who have devoted their lives to immense and greatly useful labours ? Must we
for

for ever see a stream of human blood, in order to conceive an idea of a great action?

XIII. Camoens, Don Lewis of Ercilla, but especially Milton, the younger Raune, and Klopstock, must not here be forgot. They have thought, with reason, that the discovery of a new world, and, what is of infinitely more importance, the loss of Paradise, the Christian religion, and the redemption of mankind by the Messiah, were events worthy to be made the subject of an epic poem: that they were sources from whence might be derived the greatest beauties that poetry could produce; and that Adam, considered as the origin of mankind, and the Messiah as their Saviour, and as the hero of the tribe of Judah, were personages infinitely more august and more interesting, than the furious Achilles, the intriguing Ulysses, or the pious, and, at the same time, very perfidious Æneas. For if we give the least attention, we shall be convinced, that were men now to commit such actions as Homer and Virgil have ascribed to their heroes, the least that they could expect, would be to be sent to a house of correction, or locked up in some dungeon. From hence we may conclude, that the sagacious Addison was in the right when he said, *If you are unwilling to give the title of an epic poem to the Paradise Lost of Milton, you may call it, if you please, a divine poem.* The name should never determine the value of any matter; and every poet, who would treat of any great event, any memorable and interesting action, may, without hesitation, make it the subject of an epic poem.

XIV. When the poet has made choice of his subject, and of epic poetry for the manner of treating it, he should then lay the plan of his work. As the first poets in general chanted their poems, and as Homer in particular sung his Iliad and Odyssy for charity, as he went begging through the cities of Greece, custom has established the word *sing*, for reciting in verse, or in a poetic style, the praise of any hero, or any memorable action or event: and in many parts of Italy they still sing the finest strophes of Tasso's Jerusalem

Delivered,

Delivered ; and the kind of verse, of which he has made choice, is adapted to singing, though we may regard it in itself as bad, seeing that the Alexandrine verse of twelve syllables appears to be far more agreeable to the gravity and dignity of the epopee, seeing they are much better calculated for declamation than music, as we shall shew when we come to the chapter on versification. It is an established and a very judicious custom, to begin a poem with a succinct and lively introduction or description of the subject on which we propose to treat ; as nothing is more proper to attract the regard, prejudice the determination, and fix the attention of the reader, than such an explanation. To the introduction commonly succeeds the *invocation*. The ancients addressed themselves either to the Muses, to Apollo, or some other of their divinities. This custom will appear singular enough, if we transport our imaginations to those remote ages, and reflect that mythology made the religion or theology of the heathens. Would it not be ridiculous, and even prophane, if in our days a poet, who was about to sing the actions of some hero, or some mere worldly event, should begin by calling to his assistance the holy virgin, the angels, cherubim, seraphim, or some of the saints in Heaven ? Be this however as it may, we cannot deny but that such invocation is no small ornament, and even adds something great and awful to a poem. The names of Apollo and the Muses sound better from our mouths, and in our verse, than they did in those of the ancients, who regarded them as serious divinities. Our great poets have acquired, moreover, the happy art of personifying virtues or divine qualities, and of addressing them by these sorts of invocations ; which has a very great effect. Lastly, as an epic poem forms a long and comprehensive narration, necessarily intermixed with episodes analogous to the subject, it is divided, according to the usual custom, into cantos, or, when the poem is in prose, into books, parts, &c.

XV. In order to elucidate all these precepts, by a striking example, we shall here cite the first lines of the *Henriade*. The illustrious author may serve as a model for this kind of poetry, as well as for most others of which he has treated. They are as follow :

Je chant ce Héros qui régna sur la France,
Et par droit de conquête, & par droit de naissance ;
Qui par le malheur même apprit à gouverner ;
Persécuté long-temps, fut vaincre & pardonner.
Confondit & Mayenne, & La Ligue & l'Ibere,
Et fut de ses sujets le vainqueur & le pere.
Je t'implore aujourd'hui, *sévère Vérité* :
Répands sur mes écrits ta force & ta clarté.
Que l'oreille des Rois s'accoutume à t'entendre.
C'est à toi d'annoncer ce qu'ils doivent apprendre.
C'est à toi de montrer aux yeux des nations
Les coupables effets de leurs divisions.
Dis comment la discorde a troublé nos provinces ;
Dis les malheurs du peuple, & les fautes des Princes ;
Viens, parle ; & s'il est vrai que la fable autrefois
Sut à tes fiers accens mêler sa douce voix,
Si sa main délicate orna ta tête altière,
Si son ombre embellit les traits de ta lumière ;
Avec moi sur tes pas permets-lui de marcher,
Pour orner tes attraits & non pour les cacher.

'The chief renown'd, who rul'd in France, I sing,
By right of conquest, and of birth, a king ;
In various suff'rings resolute and brave,
Faction he quell'd : he conquer'd, and forgave.
Subdu'd the dangerous League, and factious Mayne,
And curb'd the head-strong arrogance of Spain.
He taught those realms he conquered to obey,
And made his subjects happy by his sway.
O heaven-born *Truth*, descend, celestial muse,
Thy power, thy brightness in my verse infuse.
May kings attentive hear thy voice divine,
To teach the monarchs of mankind is thine.
'Tis thine to war-enkindling realms to shew
What dire effects from curst divisions flow,

Relate

Relate the troubles of preceding times,
 The people's sufferings, and the prince's crimes.
 And, O! if fable may her succours lend,
 And with thy voice her softer accents blend,
 If on thy light her shades sweet graces shed,
 If her fair hand e'er deck'd thy sacred head,
 Let her with me thro' all thy limits rove,
 Not to conceal thy beauties, but improve.

Dr. FRANKLIN.

He then begins the recital with these beautiful lines :

Valois régnoit encor : & ses mains incertaines
 De l'état ébranlé laissoient flotter les rênes, &c.

Valois then govern'd the distracted land,
 Loose flow'd the reins of empire in his hand, &c.

XVI. With regard to the execution of the plan, or the body of an epic poem, let us again take our lesson from a great master of the art, by copying the following rules, which the ingenious Boileau has given us :

Là pour nous enchanter tout est mis en usage ;
 Tout prend un corps, une ame, un esprit, un visage,
 Chaque vertu devient une divinité,
 Minerve est la Prudence, & Vénus la Beauté.
 Ce n'est plus la vapeur qui produit le tonnerre ;
 C'est Jupiter armé pour effrayer la terre ;
 Un orage terrible aux yeux des matelots,
 C'est Neptune en courroux qui gourmande les flots.
 Echo n'est plus un son qui dans l'air retentisse :
 C'est une nymphe en pleurs, qui se plaint de Narcisse.
 Ainsi dans cet amas de nobles fictions
 Le poete s'égaye en mille inventions,
 Orne, élève, embellit, aggrandit toutes choses
 Et trouve sous sa main des fleurs toujours écloses.

Here fiction must employ its utmost grace ;
 All here assumes a body, mind, and face :
 Each virtue a divinity is seen,
 Prudence is Pallas, Beauty Paphos' queen.

'Tis

'Tis not a cloud from whence swift light'nings fly,
 But Jupiter, that thunders through the sky :
 Not a rough storm that gives the sailor pain,
 But furious Neptune ploughing up the main :
 Echo's no more an empty mimic sound,
 But a fair nymph that mourns her lover drown'd.
 Thus in the *noble fictions* of his mind,
 The poet will a thousand figures find ;
 Around the work his ornaments he pours,
 And strews with lavish hands his opening flowers.

SOAMES.

By this pleasing picture, the poet teaches us that the series of events, or the history, which forms the subject of a poem, should be true, should have really happened, or at least must be founded on respectable authorities ; but that the circumstances, the incidents, and all the ornaments may, and even ought to take their source from fiction, which is the fruit of a vigorous and brilliant imagination. There should moreover be a certain *unity of action* which should run through an epic poem, but which is however less limited and rigid than that of a dramatic poem. An *action*, which is *simple* and *uniform*, and is unfolded easily, and by degrees, pleases far more than a confused heap of extravagant adventures. It is necessary also to observe, that the poet should avoid, as much as possible, the observing an historical regularity in his poem ; which is one of the greatest imperfections in the *Pharsalia* of Lucan. The historian must follow the chain of events ; the poet, on the contrary, should put all into action at once ; he ought to begin with introducing all his actors, and should inform the reader of such facts as have preceded the principal action, and are necessary either for embellishment, for eclairsissement, or, to render the story more interesting, by recitals or other inventions. It is required, moreover, that this judicious unity be ornamented with a variety of episodes which may arise from the fable, from history, or from some new and important discovery, &c.

XVII. With regard to these pleasing episodes, and the better to shew their nature and their merit, we shall here insert that which M. Voltaire has introduced in his *Henriade*, where he so happily explains, in a few lines, the renowned Newtonian system.

Dans le centre éclatant de ces orbes immenses
Qui n'ont pu nous cacher leur marche & leurs distances,
Luit cet astre du jour par Dieu même allumé.
Qui tourne autour de soi sur son axe enflammé.
De lui partent sans fin des torrens de lumière;
Il donne en se montrant la vie à la matière,
Et dispense les jours, les saisons & les ans
A des mondes divers autour de lui flottans.
Les astres asservis à la loi qui les presse
S'attirent dans leur course & s'évitent sans cesse,
Et servant l'un à l'autre & de règle & d'appui,
Se prêtent les clartés qu'ils reçoivent de lui.
Au delà de leurs cours, & loin dans cet espace,
Où la matière nage & que Dieu seul embrasse,
Sont des soleils sans nombre & des mondes sans fin;
Dans cet abyme immense il leur ouvre un chemin.
Par delà tous ces cieux le Dieu des cieux reside, &c.

Amidst those orbs which move by certain laws,
Known to each sage whom love of science draws,
The sun revolving round his axle turns,
Shines undiminish'd, and for ever burns.
Thence spring those golden torrents, which bestow
All vital warmth and vigour as they flow.
From thence the welcome day and year proceeds;
Through various worlds his genial influence spreads.
The rolling planets beam with borrow'd rays,
And all around reflect the solar blaze;
Attract each other, and each other shun:
And end their courses where they first begun.
Far in the void, unnumbered worlds arise,
And suns unnumber'd light the azure skies.
Far beyond all, the God of Heaven resides,
Marks every orbit, every motion guides, &c.

Dr. FRANKLIN

The

The description of the temple of Love, in the ninth canto, which begins with these lines,

Sur les bords fortunés de l'antique Idalie,
Lieux où finit l'Europe & commence l'Asie,
S'élève un vieux palais respecté par les temps ; &c.

Fix'd on the borders of Idalia's coast,
Where sister realms their kindred limits boast,
An ancient dome superior awe commands ; &c.

Mr. GREEN.

is also a delightful episode, that is crowded with beauties. It is essentially necessary, however, that all these episodes be analogous, or at least agreeable to the subject ; and that they be so artfully introduced as to appear to be the pure work of nature.

XVIII. Comic or burlesque poems, such as Homer's *Batrachomyomachia*, or, *The Battle between the Frogs and Mice*, the *Lutrin* of Boileau, the *Orlando furioso* of Ariosto, the *Rape of the Lock* by Pope, the *Secchia rapita* of Tassoni, the *Phaeton* of Zachariah, and many more, are properly no other than a kind of parody of an epic poem, all the rules of which are observed in their composition. M. Voltaire, however, justly observes, that Europe will never place Ariosto with Tasso, that is, the comic with the epic, till it places the *Æneis* with *Don Quixotte*, and Callot with Corregio. M. Despreaux, notwithstanding, has found the art of ennobling the comic in his *Lutrin*, and of rendering it equally agreeable and interesting. He has not there heaped burlesque on burlesque, but has cautiously avoided the low comic, the trivial and gigantic ; so that we cannot say to him as Cardinal d'Este said to Ariosto, *Dove Diavolo, Messer Ludovico, havete pigliato tanto coglionerie ? Where the devil, Master Lewis, did you pick up all this ribaldry ?* M. Gresset has shown us, in his *Vertvert*, and in his *Chartreuse*, that, between the heroic and the burlesque, there is still another species of poetry, a

sort of epopee, that partakes of the moral, the satyric, the serious, the gay, and the refined comic.

XIX. What one of the greatest masters of the art has said, when treating on epic poetry, with regard to reading the *chefs-d'œuvres* of this kind themselves, is highly judicious, very true, and very instructive; but it is not less certain, that the principles and rules are also useful, not to say indispensable, to those who would read these master-pieces to advantage, and make them the models of their labours. The strongest proof of this is, that Aristotle and his successors have formed their poetics on the works of Homer, and other renowned poets of their times; that is to say, they have drawn their precepts less from reason than from example. What is the consequence? They have either not said all that is essential, or they have frequently erred and deceived themselves with their models. The same will happen to every poet who shall read, without knowledge of the principles, any excellent poem in order to imitate it. He will frequently wander from the truth in his pursuit: frequently will he take liberties; and frequently will he give himself shackles, when neither the one nor the other are directed by sound reason. For we are not to imagine, that all the rules of the art tend to curb and check genius: on the contrary, wise precepts tend to enlarge the bounds of its liberty. Thus have we lightly sketched the draught of an epic poem. The limits of this work perpetually check our pen. Let us pass directly to the second species of poetry, which is the dramatic, and where perhaps we may be again tempted to exceed the bounds that we intend to prescribe to our inquiries.

XX. Although in an epic poem, as in a fable, and some other kinds of poetry, they almost always make those persons speak that are introduced, they are still, in general, no other than narrations, and consequently cannot belong, by their nature, to the dramatic species. For the *drama* (which comes from the Greek, δράμα *actio*) consists not of a simple narrative, but in the representation of an action, which necessarily requires a dialogue, and which is intended to be re-
presented

presented on a theatre. At least, this is the sense in which we take the word, without regarding its critical and etymological signification. Of all the species of poetry, the drama is the most important, as it is calculated to entertain and to instruct, to refine the taste, to correct the manners, and meliorate the character; in a word, as it serves to enlighten and to polish whole nations. We speak, however, of the modern drama only, and especially that of France, which is so beneficial, and does so much honour to that nation. If the doctors of the primitive church had known dramatic entertainments like ours, they would have extolled and commended the use of them as much as they condemned and proscribed those of their own times. Their conduct then was right, now it would be egregiously wrong. Unluckily, however, there are frequently, among their successors, weak men, who, judging by the name only, and being unable to distinguish either the essence, the character, or the different qualities of these performances, rail because their predecessors declaimed. Reason and sound policy now lift up their voice, and tell us that every civilized people should encourage theatres that are decent, polite, and refined: and that those authors, who cry out against this institution, who discourage men of exalted genius from labouring for the public theatre, and who would prevent the people from polishing their manners, and enjoying an innocent and useful recreation, are senseless bigots; and, what is worse, pernicious citizens, whose writings deserve much more to be committed to the flames, than those of some philosophers who may have erred in searching after the truth. But,

Le crime fait la honte & non pas l'échafaud.

It is the crime that makes the shame, and not the pil-
lory.

The abuse that has been made of burning philosophical writings has turned that disgrace into reputation. It can no longer impose but on the meanest of mankind. Men who are endowed with reasoning examine a book itself, and value its merits: for they know that councils of state, and tribunals of justice, are as little capable of deciding about the truths and errors of philosophy, as academies are of determining the interests of nations, or the municipal laws of different states. This ancient pedantry of government is become ridiculous in the eyes of wise men; and if it is still put in practice, it should be to condemn such writings to the flames, as tend to stifle the genius of a nation, and to deprive it of that which affords at once pleasure and instruction.

XXI. The principal dramatic pieces that are now exhibited on the theatres of civilized nations, are, 1. Tragedy: 2. Comedy: 3. The Opera: 4. The Comic Opera: 5. Pastorals: 6. Interludes: 7. Pantomimes; and, 8. Drolls. And this order we shall observe in the short analysis we here propose to make.

XXII. A *Tragedy* is a dramatic poem that represents on a theatre some signal action, or some fatal incident in the life of an illustrious personage. The design of it is to exalt, in the minds of the spectators, the value of great virtues and sublime sentiments; and at the same time to paint, in the strongest colours, the meanness of vice, and the horror of iniquity: and this end it endeavours to obtain by influencing the two grand springs of the human mind; that is, by exciting our *pity* and our *terror*; which it does by employing its art so to move the mind of the spectator, that he may become so interested in the fate of the virtuous and unfortunate characters that are introduced on the stage, that their misfortunes may cause in him either dread or compassion; and, on the contrary, that the actions, the sentiments, and success of vicious characters, may inspire him with horror and indignation. A tragedy therefore is the representation of one event only, and not a collection

lection of various adventures. In such event, there must consequently be observed a triple unity; that of time, place, and action. M. Despreaux has very happily expressed all these essential properties of a tragic drama, where he says,

Le sujet nest jamais assez tôt expliqué,
Que le lieu de la scene y soit fixe & marqué.
Un rimeur sans péril, delà les Pyrénées,
Sur la scene en un jour renferme des années.
Là souvent le Héros d'un spectacle grossier,
Enfant au premier acte, est Barbon au dernier.
Mais nous que la raison à ses regles engage,
Nous voulons qu' avec art l'action se ménage.
Qu'en un lieu, qu'en un jour, un seul fait accompli
Tienne jusqu'à la fin le théâtre rempli.

You never can your plot too soon unfold;
Nor the scene fix by marks too plain and bold.
A Spanish poet may with good success,
In one day's space, an age's acts express.
There, oft the hero of a wandering stage,
Begins a child, and ends in doting age.
But we, who are by reason's rules confin'd,
Require the plan to be with art design'd;
That unity of action, time, and place,
Keep the stage full, and all your labours grace.

SOAMES.

The particular rules flow quite naturally from the definition itself, and from the essential principles of tragedy. It is impossible to enter into an examination of them here, unless we would write a regular treatise on the art of poetry, which is neither our design, nor can come within the bounds of our plan.

XXIII. We shall, however, say a few words more on this matter, as it requires to be so far extended. A tragic poem should be always divided into five, or at least into three acts. The reason is, that the mind of the spectator must necessarily be relaxed, as it cannot attend for so long a time to the subject, with-

out some intermission; as his pleasure would thereby degenerate into fatigue. In a tragedy, moreover, the scenes should not be imbued with blood; for whatever is cruel and shocking to human nature cannot afford pleasure to a rational and well instructed mind. The author should take care, likewise, that those things which are savage and horrid do not there hold the place of the mournful and pathetic. He should not inspire horror when he would excite fear or pity. Every thing, which is absolutely useless, becomes insipid and enervates the performance: no character should therefore be introduced that is not essential to the piece. After having observed all these rules, he should hasten to the *conclusion*, and not drag it slowly on: and consequently the catastrophe should be concise, animated, natural, by no means forced, and, if it be possible, happy: for the spectators will depart so much the more pleased with the performance, as mankind love to see vice punished, and virtue rewarded.

XXIV. Permit us to propose a question here, though perhaps it may be thought presumptuous. Is it impossible to conceive a theatric exhibition, or tragedy, that shall be still more perfect than any that has yet been produced by the most polished nations? When some signal action is represented on a theatre, might we not, for example, place, before the eyes of the spectators, the grand incidents that concurred in that action, in a manner very different from that of a cold and meagre description? Would they not be charmed to see the action itself as it really happened; those great events in ancient and modern history; such as some famous siege, a memorable battle, a triumph, an august ceremony; a tremendous conflagration; a naval combat, like that of Actium; the Capitol in flames; Olympus and the Gods; and a thousand like exhibitions? This would be in a manner recalling past ages, and making mankind live again in succeeding centuries. The opera, it is true, by its machines, its decorations, its choruses and ballettes, does in some degree execute this idea,

idea, but it does it very imperfectly. The singing, the music, the diminutive stage, the miniature decorations, and an hundred absurd customs that concur in an opera, render it trifling and contemptible. What we here propose, is an exhibition of an unbounded nature, an entertainment that should engage the attention, and be undertaken at the expence of a whole nation, in an edifice equal to the Circus: for it is easy to conceive, that representations like these, a dramatic tragedy, attended by all its circumstances, can never be exhibited on so confined a stage as ours, and where those parts which are assigned for the spectators being frequently empty, give a languishing air to the whole, while the projector dies of hunger. We are sensible, that in such an exhibition the comic would be very liable to steal in with the tragic, but we think that an author, of real ability, would easily be able to separate them, and to assign to each its proper bounds.

XXV. A *comedy* is a drama that is calculated to represent some action, or ordinary event in life, but such as is capable of being interesting, by ridiculing the vices or follies of mankind. The end of comedy, therefore, is to correct the manners by diverting the mind: for mankind are always ready to laugh excessively at those follies they are daily committing. There are three tribunals for correcting our manners, the limits of which should never be confounded: The first is public justice, which punishes omissions and transgressions; the second is the pulpit, which combats vices, and exhorts to the moral virtues; and the third is the theatre, which, in comedy, lashes our follies, and animates us to a prudent conduct; and in tragedy, makes, by its examples, vice odious, and virtue amiable. From hence it follows, that those crimes which are punished by the executioner should never be represented in tragedy: nor in comedy, those moral declamations which properly belong to the pulpit. Every piece, which through inattention errs in these respects, is imperfect. The rest of the particular precepts relative to comedy in

general, are contained in these verses of the art of poetry :

Que la Nature donc soit votre étude unique,
Auteurs qui prétendez aux honneurs du comique.
Quiconque voit bien l'homme, & d'un esprit profond
De tant de cœurs cachés a pénétré le fond ;
Qui fait bien ce que c'est qu'un prodigue, un avare,
Un honnête homme, un fat, un jaloux, un bizarre ;
Sur une scène heureuse il peut les étaler,
Et les faire à nos yeux vivre, agir & parler,
Présentez-en partout les images naïves :
Que chacun y soit peint des couleurs les plus vives.

Ye bards, that would the comic laurel wear,
To study Nature be your only care.
Whoe'er knows man, and, by a curious art,
Discerns the hidden secrets of the heart ;
He who observes, and naturally can paint
The jealous wretch, the fawning sycophant,
A worthy man, an enterprising fool,
An anxious miser, and a happy droll,
May safely in these nobler lists engage,
And make them justly act upon the stage.
Strive to be natural in all you write,
But still with vivid colours charm the sight.

SOAMES.

XXVI. Partisans as we are of an exact imitation of nature, and of the decency of expression, there is, however, in this respect, one very essential observation we must make, as well with regard to theatric representations in general, as to comedy in particular. Every drama is intended, not so much to be leisurely read in the closet, or to be examined by a near and deliberate view, as to be seen at a distance, and in a transient manner on the stage. It is a kind of perspective, a piece of sculpture that is to be placed far from the eye, and that consequently requires strokes that are strong and bold, and proportions that are almost gigantic, or at least beyond the natural size.

size. A too rigid imitation of nature, the plain truth without any exaggeration, the minute and delicate touches, and the refinements in morality, with which the greatest part of modern pieces are crowded, are therefore altogether wrong placed, and become real imperfections. For the finest strokes in dialogue passing on the stage like lightening before our eyes, we have not time to consider their delicacy, and therefore they should be bold and striking. When M. Despreaux reproached Moliere, *that he sometimes distorted his characters*, it is because he understood not the theatre, nor the human mind and heart, so well as that inimitable comic. These supposed extravagancies are much more judicious than is commonly imagined. Regnard, whom we may regard as the first comic writer after Moliere, saw right well the necessity for these just exaggerations; and we cannot read, without indignation, those curtailings which have been made of the finest strokes of that author, in the new edition of his dramatic works. He, who has been charged with this curious operation, must have had a clumsy hand, and very little sensibility. When Hector, in the Gamester, presents to careful Geronte the list of his son's debts, and he sees the allowance to Mademoiselle Margot de la Plante, he cries out *two hundred and fifty crowns!* to which the valet replies,

Ce n'est ma fois pas cher,
Demandez ; c'est, monsieur, un prix fait en hiver.

And faith, sir, not dear,
'Tis a set price, you'll find, for the winter half year.

The senseless corrector has struck out this admirable passage, and has supplied its place with an insipidity. The manners of a woman must be extremely depraved, if the delicacy of her ear is to be offended by such an expression as this: so general a corruption of the morals of a people ought never to be supposed; nor should authors be allowed to conceal, under that
pretext,

pretext, the sterility of their genius, and disgust by performances that are extremely decent, but at the same time totally insipid, as those of our days.

XXVII. For the same reason, the sentiments of virtue, and of the dignity of the human mind, should be constantly a little enhanced in tragedy. Nothing, however, should be carried to the utmost extremity. These sentiments are like medals that are preserved in a cabinet of curiosities, and which we keep as models, but are not by any means to be used as the coin in the ordinary affairs of life. For the same reason also, *the new pathetic species*, or as it is called in derision, *the crying species*, must be regarded as defective. There appears to be but little reason for introducing actors of the sect of Heraclitus on the stage, and to confound the laughing Thalia with the weeping Melpomene; or to borrow scenes, or some meagre scraps, or edifying trifles from romance, which, however, the spectators sometimes wonderfully admire. These are by no means designed to be considered from a distant point of view. The man of taste will sooner suffer those Italian performances, where the rule of the imitation of nature is altogether violated, where all the characters are ideal, as harlequin, pantaloon, the doctor, &c. where fiction reigns from one end to the other, and where sorcery and miracles constantly hold the place of that which is true and natural. These exhibitions are certainly, beyond comparison, inferior to the natural and noble comedies of the French: but the bold designs, the lively strokes, and pleasing sallies, oft times so far atone for the trifling nature of these performances, that the spectator frequently goes away from the Italian comedy in high mirth; and sometimes remembers, during his whole life, some particular scenes with which he was highly entertained.

XXVIII. A regular comedy must also consist of either five or three acts. The *petit piece*, or *farce*, which is represented after the other, consists but of one act, and should be as full of vivacity as possible; the dialogue should be highly animated; there should
be

be much action, and not a word or incident that is insignificant. In general, when we would compose a piece for the theatre, we should begin by laying the plot, by making a rough sketch in the nature of a romance, and then proceed to the dialogue. We shall finish these reflections on comedy in general with one remark. Augustus reproached Terence with wanting in his comedies what he called the *vis comica*. These words imply more than is commonly imagined. It is difficult to render them in modern languages, though we know very well what they mean: and we may boldly say, that all those dramas, where the comic power does not prevail, do not deserve the name of comedies, and that they are only a kind of amphibious productions, which are properly enough called *pieces*, such as *Cenia*, *Melanida*, &c. The English expresses, by the word *humour*, something that nearly answers to the *vis comica*.

XXIX. An opera is a drama represented by music. This entertainment was invented at Venice, and Abbé Perrin was the first who introduced it at Paris in the year 1669. An exhibition of this sort requires a most brilliant magnificence, and an expence truly royal. The drama must necessarily be composed in verse; for as operas are sung and accompanied with symphonies, they must be in verse to be properly applicable to music. To render this entertainment still more brilliant, it is ornamented with dances and ballettes, with superb decorations, and surprising machinery. The dresses of the actors, of those who assist in the chorus, and of the dancers, being all in the most splendid and elegant taste, contribute to render the exhibition highly sumptuous. It was this that gave occasion to the following verses of M. V——

Il faut ce rendre à ce palais magique
Où les beaux vers, la danse, la musique,
L'art de tromper les yeux par les couleurs,
L'art plus heureux de séduire les cœurs,
De cent plaisirs font un plaisir unique.

We cannot refrain from resorting to this enchanting palace, where the beauties of poetry, where music and the dance, where the illusive art of colours, and the still more happy art of seducing the mind, make, of a hundred, one unrivalled pleasure. But notwithstanding this union of arts and pleasures, at an immense expence, and notwithstanding a most dazzling pageantry, an opera appears, in the eyes of many people of taste, but as a magnificent absurdity, seeing that nature is never there from the beginning to the end. It is not our business here, however, to determine between the different tastes of mankind. We shall speak of the music, the dances, and the decorations, the painting and machinery of operas, in the chapters that are assigned to these matters, and shall here consider the poem only, which makes the ground-work of the performance.

XXX. The method of expressing our thoughts by singing and music is so little natural, and has something in it so forced and affected, that it is not easy to conceive how it could come into the minds of men of genius to represent any human action, and what is more, a serious or tragic action, any otherwise than by speech. We have, it is true, operas in Italian, by the illustrious Metastasio, and in French by M. Quinault, Font nelle, &c. the subjects of which are so grave and tragic, that one might call them musical tragedies, and real *chefs d'œuvres* in their kind. But I think I have observed, that though we are highly satisfied, and greatly affected, on reading them, yet the spectator is more charmed with the magnificence of the sight, and the beauty of the music, than moved with the action, and the tragical part of the performance. We are not, however, of that order of critics who strive to prove, that mankind act wrong in finding pleasure in an object with which they are really pleased; who blame a lover for thinking his mistress charming when her features are by no means regular; and who are perpetually applying the rules of logic to the works of genius: we make these observations merely in order to examine if it be
not

not possible to augment the pleasures of a polite people, by making the opera something more natural, more probable, and more consonant to reason.

XXXI. We think, therefore, that the poet should never, or at least very rarely, chuse a subject from history, but from fable or mythology, or from the regions of enchantment. Every rational mind is constantly shocked to hear a mutilated hero trill out, from the slender pipe of a chaffinch, *To arms! To arms!* and in the same tone animate his soldiers, and lead them to the assault; or harangue an assembly of grave senators, and sometimes a whole body of people. Nothing can be more burlesque than such exhibitions; and a man must be possessed of a very uncommon sensibility to be affected by them. But as we know not what was the language of the gods, and their manner of expressing themselves, we are at liberty, in that case, to form what illusions we please, and to suppose that they sung, to distinguish themselves from mortals. Beside, all the magic of decorations and machinery become natural, and even necessary, in these kind of subjects, and therefore readily afford opportunity for all the pomp of these performances. The chorus, the dances, the ballettes, the symphonies and dresses, may likewise be all made to correspond with such subjects: nothing is here affected, absurd, or unnatural. Whoever is possessed of genius, and is well acquainted with mythology, will there find an inexhaustible source of subjects highly diversified, and quite proper for the drama of an opera.

XXII. We shall speak, in the chapter on music, of that sort which appears to us the most proper for such a drama, and of the several alterations of which we think it susceptible, in order to make it more complete, and to adapt it to a more pathetic, more noble, and more natural expression, as well in the recitatives as in the airs and chorus. We have only here to consider the business of the poet. He should never lose sight of nature, even in the midst of the greatest fiction. A god, a demi-god, a renowned hero,

hero, such, for example, as Renaud in Armida, a fairy, a genie, a nymph, or fury, &c. should constantly be represented according to the characters we give them, and never be made to talk the language of a fop, or a *petite maitresse*. The recitative, which is the ground-work of the dialogue, requires verses that are free and not regular, such as with a simple cadence approach the nearest to common language. The airs should not be forced into the piece, nor improperly placed for the sake of terminating a scene, or to display the voice of a performer: they should express some sentiment, or some precept, short and striking, or tender and affecting, or some simile lively and natural; and they should arise of themselves from a monologue, or from a scene between two persons: prolixity should here be particularly avoided, especially when such an air makes part of a dialogue; for nothing is more insipid or disgusting than the countenances of the other actors who appear at the same time, whose silence is quite unmeaning, and who know not what to do with their hands and feet, while the singer is straining his throat. The verses of all the airs should be of the lyric kind, and should contain some poetic image, or paint some noble passion, which may furnish the composer with an opportunity of displaying his talents, and of giving a lively and affecting expression to the music. A phrase that is inanimated can never have a good effect in the performance, but must become insipid and horribly tedious in the air. The trite similes of the Italians, of a stream that flows, or a bird that flies, &c. are no longer sufferable. The same things may be said with regard to the chorus, which should be equally natural and well adapted: it is here sometimes a whole people, sometimes the inhabitants of a particular country, and sometimes warriors, nymphs, or priests, &c. who raise their voice to demand justice, to implore favour, or render a general homage. The action itself will furnish the poet of genius with ideas, words, and the manner of disposing them.

XXXIII. Lastly, the opera being a performance calculated less to satisfy the understanding than to charm the ear, and affect the heart, and especially to strike the sight, the poet should have a particular attention to that object, should be skilled in the arts of a theatre, should know how to introduce combats, ballettes, feasts, games, pompous entries, solemn processions, and such marvellous incidents as occur in the heavens, upon earth, in the sea, and even in the infernal regions; but all these matters demand a strong character, and the utmost precision in the execution; for, otherwise, the comic being a near neighbour to the sublime, they will easily become ridiculous. The unity of action must certainly be observed in such a poem; and all the incidental episodes must concur to the principal design; otherwise it would be a monstrous chaos. It is impossible, however, scrupulously to observe the unity of time and place, though the liberty which reason allows the poet in this respect is not without bounds; and the less use he makes of it, the more perfect his poem will be. It is not, perhaps, impossible so to arrange the objects, that, in changing the decorations, the painter may constantly make appear some part of the principal decoration which characterises the situation of the scene, as the corner of a palace at the end of a garden, or some avenue that leads to it, &c. But all this is liable to difficulties, and even to exceptions; and the art of the painter must concur in such case with that of the poet. For the rest, all the operas of Europe are at least one-third too long, especially the Italian; and so are all our tragedies. The unity of action requires brevity; and satiety is inseparable from a diversion that lasts full four hours, and sometimes longer. They have indeed endeavoured to obviate this inconvenience by dividing an opera into three, and even into five acts; but experience proves that this division, though judicious, is still not sufficient to relieve the wearied attention.

XXXIV. The prologues, which frequently precede operas and all sort of dramatic performances, consist sometimes

sometimes of ingenious fictions, which serve to inform the spectators of the design of the piece, that help to explain it, or to apologize for the author: and under this form it was that they chiefly appeared among the ancients. Sometimes they are contrived to make the eulogy of a monarch, a prince, or hero, and to celebrate, in a feigned dialogue, such real events as conduce to his pleasure and glory. Genius is the producer of a dialogue, delicacy is the soul of it, and insipidity is the gulph into which it commonly sinks. We cannot conceive how it was possible for the wise monarchs of the last age to suffer those clouds of incense, those extravagant and accumulated praises, from players who were their hired servants, and that to their face, and in the presence of all their people. Nothing but an idol could suffer such incense to be offered to it in such a temple. The prologue before an opera is sung, but is recited before a tragedy or comedy.

XXXV. *A comic opera* is a sort of parody of the serious opera. Sometimes it contains a refined, judicious, and pleasant critique on some other famous opera or tragedy; at others, it is founded on some simple, natural, and pleasant subject, adapted to the drama and to music. This kind of entertainment is now brought to a great degree of perfection, as well in France as in Italy. The *Wit-catcher*, the *Village-conjurer*, and some other similar pieces, are, in my opinion, *chefs-d'œuvres*. In France they adapt the tunes of vaudevilles, or the most common and applauded songs, to the words of such an opera; and this method produces a charming effect. In Italy, where they call such an exhibition *opera buffa*, the greatest poets, and the most able musicians, exercise their talents in these compositions. The *interludes*, or, as the Italians call them, *intermezzi*, as they are represented between the acts, are a kind of comic opera performed by two or three actors. The celebrated Pargolesi has set some of these to music, and among others *la Serva Padrona*, which will for ever receive the applause of the connoisseur, and of every

man of taste. They are likewise divided into three acts, and are intermixed with airs, recitatives, and duos, in the same manner as the serious opera.

XXXVI. There are also a sort of low farces that are called *drolls*. This entertainment took its rise from the rope dancers and mimics, who set their buffoons in a kind of gallery on the outside of their place of exhibition, that they might attract and draw in the passengers by their mimicry, their postures, and drollery. These performers exhibited at first an extempore entertainment, altogether insipid; but, for some time past, they have applied themselves to the forming some ingenious plan for their performances: and very sensible people also sometimes amuse themselves, in their private apartments, with imitating these entertainments. They chuse a dramatic subject; they lay the plot of a little farce, and perform it on the spot extempore. It must be confessed, that an entertainment of this kind has a great appearance of truth, from that natural and unstudied language of which the dialogue consists.

XXXVII. The German theatre first produced, not very long since, a new kind of drama, which consists of *pastorals*. But we may literally say, that this entertainment is renewed from the Greeks and Romans. The idea doubtless arose from the eclogues, the idyls, and pastorals of the ancients. Now, whether such a pastoral be represented by a simple recital or declamation, or whether it be applied to music, by forming it into an *operetta*, the simplicity of the expression, the ingenious imitation of nature, and the beauties that thence result, that delicacy and tender sentiment, which make the soul of this entertainment, the character of the shepherds, their dress, and the rural scenes, together with the pleasing decorations, all concur to make it extremely affecting and agreeable. But it must not be too frequently repeated: for it is not susceptible either of great variety or great elevation; nor is it compatible either with high tragedy or finished comedy: and all those things that are merely delicate, that will not admit, so to say,

say, of colours that are strong, bold, and striking, soon fade, especially on the theatre. We shall finish our observations on dramatic poetry with one precept, and which is, perhaps, the most important of all others: it is, *that the grand and sublime sentiments in tragedy, and the sallies, bons mots, and pleasantries in comedy, should always arise from the subject itself*, and not appear to be the product of the poet's wit, forced into the piece: it should constantly be the person who is represented, speaking in his proper character, and not the author.

XXXVIII. After the epic and dramatic, we place, in the third rank, *lyric poetry*. That name was given it by antiquity. Under this class it ranged those poems, or pieces in verse, that were sung and accompanied with an instrument they called a lyre. The moderns have preserved the same denomination, and annexed to it, some small difference excepted, the same idea. Thus Pindar is called the prince of the Grecian lyric poets, Horace of the Latin, and Malherbe of the French. But the lyric kind comprehended, even among the ancients, different kinds of verse: it comprehends also still more variety among the moderns, and especially among the French. As our music is greatly improved, and our instruments more numerous than those of the ancients, *we now range, under the lyric kind, all those pieces in verse that may be sung with an accompaniment, that are not composed for the theatre, and that do not belong to the dramatic or any other particular species of poetry*.

XXXIX. The first sort of lyric poetry is the *ode*. Of this M. D. Spreaux has given us a very beautiful and just description in these lines:

L'Ode avec plus d'éclat, & non moins d'énergie
Elevant jusqu'au ciel son vol ambitieux,
Entretient dans ses vers commerce avec les Dieux.
Aux Athletes dans Pise elle ouvre la barrière,
Chante un vainqueur poudreux au bout de la carrière;
Mene Achille sanglant au bords du Simois
Ou fait flechir l'Escaut sous le joug de Louis.

Tantôt

Tantôt comme une abeille ardente à son ouvrage
 Elle s'en va de fleurs dépouiller le rivage :
 Elle peint les festins, les danses & les ris,
 Vante un baiser cueilli sur les levres d'Iris,
 Qui mollement résiste & par un doux caprice
 Quelquefois le refuse, afin qu'on le ravisse.
 Son style impetueux souvent marche au hasard.
 Chez elle un beau desordre est un effet de l'art,
 Loin ces rimeurs craintifs, dont l'esprit phlegmatique
 Garde dans ses fureurs un ordre didactique :
 Qui chantant d'un heros les progrès éclatans,
 Maigres historiens, suivront l'ordre des temps.
 Apollon de son feu leur fut toujours avare, &c.

The lofty ode demands the strongest fire
 For there the muse all Phœbus must inspire,
 Mounting to heav'n in her ambitious flight,
 Amongst the gods and heroes takes delight ;
 Of Pisa's wrestlers tells the sinewy force,
 And sings the dusty conqueror's glorious course ;
 To Simois' banks now fierce Achilles sends,
 Beneath the Gallic yoke now Escaut bends :
 Sometimes she flies, like an industrious bee,
 And robs the flowers by nature's chymistry ;
 Describes the shepherds dances, feasts, and blifs,
 And boasts from Phillis to surprise a kiss,
 When gently she resists with feign'd remorse,
 That what she grants may seem to be by force.
 Her generous style will oft at random start,
 And by a brave disorder shew her art ;
 Unlike those fearful poets whose cold rhyme
 In all their raptures keep exactest time,
 Who sing th' illustrious hero's mighty praise,
 Dry journalists, by terms of weeks and days ;
 To these Apollo, thrifty of his fire,
 Denies a place in the Pierian choir, &c.

SOAMES.

These words, when attentively considered, include every thing essential that we can here say on the choice of a subject, and on the poetic composition of an ode. With regard to the different characters of which
 it

it is susceptible, the different species of verse of which it may be formed, and the general rules which the poet should observe in composing it, we shall treat more amply of these in the following chapter on versification, where we shall likewise give such examples as are capable of throwing yet stronger lights on the rules and precepts : and we shall do the same with regard to all other kinds of poetic composition of which we have yet to treat in this chapter, and which we here mention, once for all, to avoid repetition.

XL. To the lyric gender of poetry likewise belong,

1. *Stanzas*, which are a sort of odes in strophes or couplets of 4, 6, 8, 10, or 12 verses. They are also sometimes made in odd numbers, as 5, 7, 9, or 13 verses. They require less fire, less of the poetic enthusiasm, than the ode. They march more gravely on ; and it is for this reason that several celebrated poets have deceived themselves, and have called that an ode which is in fact nothing more than stanzas.

2. *Quadrans* are stanzas of four verses. Their character is usually that of the simple and grave. They are commonly composed of long verses, and have a sense detached the one from the other. Those of Pybrac, maugre all their faults, may serve as models for this species of poetry.

3. *Madrigals* are pieces of amorous poetry, composed of an indefinite number of feet and unequal verses, and that contain some tender and delicate sentiment. The thought, with which the madrigal concludes, is not so pointed and lively as that of the epigram. A certain beautiful simplicity, noble and graceful, forms, on the contrary, its characteristic. The madrigal is not usually divided into stanzas, and consequently cannot serve as a song, but may very properly be applied to a grand air.

4. The *rondeau* is not commonly sung ; but there are some of them that might be set to music with great success, and would have a particular grace. The *rondeau*, of a Gaulish extraction, has simplicity
for

for its portion, says Boileau; and in fact that is its characteristic.

5. *Triolets* are short rondeaus, consisting of five or eight verses with two rhymes. The subject is sometimes pleasant, and sometimes satiric. They are now very little used.

6. The *sonnet* is a poem included in fourteen verses. This is the most difficult piece in all poetry. It is necessary to be here scrupulously exact. There should be no superfluous expression, nor any one word repeated. The close should be fine and happy, that is, it should finish with a brilliant thought. This occasioned M. Despreaux to say,

Un sonnet sans défaut vaut seul un long poëme.

One faultless sonnet's a long poem's worth.

7. The *vaudevilles* are a peculiar sort of songs that are sung by the common, and not unfrequently by the better sort of people, on all kind of subjects. The French excel in these, and it must be confessed, that there are some of them that are highly pleasing.

Le François né malin forma le vaudeville,
Agréable, indiscret, qui, conduit par le chant,
Passe de bouche en bouche & s'accroît en marchant.
La liberté Françoisse en ses vers se déploie;
Cet enfant du plaisir veut naître dans la joie.

BOILEAU.

The lively French, by nature made to rail,
In libels and lampoons can never fail,
Pleasant detraction that by singing goes
From mouth to mouth, and as it travels grows.
Their freedom in their poetry they see,
The child of joy, begot by liberty.

SOAMES.

8. The *lays* formed the lyric poetry of the old French poets. The word, which comes from *lessus*, signifies a complaint or lamentation. There were anciently the grand and the common lay. The former was

was a poem of twelve stanzas of verses with two rhymes. The other was of sixteen or twenty verses divided into four stanzas, and also, almost always, with two rhymes. They pretend, that these were formed on the model of the trochaic verses of the Greeks and Latins.

9. The *virelays* differ from the lay, 1. That they put as many masculine rhymes after each other as they please, and then a feminine; and after some stanzas they vary and put several feminine rhymes together, and then a masculine: 2. As it is necessary that all the verses be equal; whereas in the lay, the intercalary verses are shorter. The term *virelay* comes from the word *virer* to *turn*, because, after having formed the lay for some time by a ruling rhyme, they turn it to another rhyme.

10. The *chant royal* is also a monument of the ancient French poetry. It is preserved in a few places only, as at Thoulouse in the academy of the floral games. It was so called because the subject was given by the king of the preceding year, that is, by him who had won the prize the preceding year. The *chant royal* is made to the glory of God, or of the holy virgin, or on some other grand and serious subject. It commonly consists of five stanzas, each of eleven verses; and is terminated with an address, or explication of the allegory, and which is of five verses, or at the most seven. The rules of the versification are here the most difficult; and the reader seldom accounts with the poet for this laborious pedantry.

11. The *ballad* has the same relation to the *chant royal* as the *triolet* has to the *rondeau*. It consists of three stanzas only, and an address, which is of four or five verses, according as the stanza is of eight or ten.

La Ballade asservie à ses vieilles maximes
Souvent doit tout son lustre au caprice des rimes.

The ballad, slave to rules of ancient times,
Has oft no merit but its humorous rhymes.

as Boileau justly says. Examples of these are to be found in Marot, Sarrafin, and elsewhere.

XLI. 12. The *masquerades* are a kind of short verses, sometimes satiric, and sometimes in form of compliment, made for the use of the masks in the time of the carnival, or some other public entertainment or masked ball. To this class may be referred the Italian masquerades, which the lyric poets of that nation make for their carnivals; as also the impromptu or extemporary productions, which the poets of the courts of some German princes are obliged to make on occasion of some solemn festival, or entertainment of the court, as the representation of a rural œconomy, &c. It is easy to conceive what sort of compositions these must be.

13. The *amphigouries* of France, and the *quolibets* of Germany, are nearly the same as the foregoing. They are a sort of conundrums in short verses, that contain points, or satirical allusions, but have no continued meaning, or connexion of ideas. They are all of the lyric kind, and are commonly sung.

14. The *romance*, or story, is now a kind of song, in which is recited some event taken either from fabulous or real history, or from some event that has happened to lovers, &c.

15. The *concordants* are verses that have several words in common, and that contain a meaning either opposite or different, by means of other words. These are very common in operas, in the duos, &c. as,

Je m'abandonne à	{ mon ardeur. }	
	{ ma fureur. }	
Quel trouble me faïsit	{ ma surprise }	} est extrême.
	{ ma fureur }	
	{ Chantez }	} tant de vertus.
	{ Chantons }	
Il faut	{ mourir }	} pour satisfaire.
	{ partir }	
A cette Loi sévère, &c.		

16. The *elegy*, or *complaint*, belongs, on several accounts, to the lyric species ; forasmuch as singing appears to be quite proper to funeral grief and the lamentation of lovers. The poet should remember in composing his elegies to adapt them to music, or at least to make them susceptible of it ; as he will, by that means, provide subjects for grand and pathetic airs, cantatas, &c. Let us again hearken to M. Despreaux. Nothing can be more beautiful than what he says on the elegy :

La plaintive élégie en longs habits de deuil
Sait les cheveux épars gémir sur un cercueil,
Elle peint des amans la joie & la tristesse,
Flatte, menace, irrite, apaise une maîtresse ;
Mais pour bien exprimer ces caprices heureux,
C'est peu d'être poète, il faut être amoureux.
Je hais ces vains auteurs, dont la Muse forcée
M'entretient de ses feux, toujours froide & glacée ;
Qui s'affligent par art, & sous de sens rassis
S'erigent pour rimer en amoureux transis. [vaines,
Leurs transports les plus doux, ne sont que phrases
Ils ne savent jamais, que se charger de chaînes,
Que bénir leur martyre, adorer leur prison,
Et faire quereller le sens & la raison.
Ce n'étoit pas jadis sur ce ton ridicule
Qu'amour dictoit les vers, que soupiroit Tibulle :
Ou que du tendre Ovide, animant les doux sons,
Il donnoit de son art les charmantes leçons.
Il faut que le cœur seul parle dans l'élégie.

The plaintive elegy, in mournful state,
Dishevell'd weeps the stern decrees of fate.
Now paints the lover's torments and delights,
Now the nymph flatters, threatens, or invites.
But he, who would these passions well express,
Must more of love than poetry possess.
I hate those lifeless writers whose forc'd fire
In a cold style describes a hot desire ;
Who sigh by rule, and raging in cold blood,
Their sluggish muse spur to an am'rous mood.

Their

Their ecstasies insipidly they feign,
 And always pine, and fondly hug their chain,
 Adore their prison, and their sufferings bless,
 Make sense and reason quarrel as they please.
 'Twas not of old in this affected tone,
 That smooth Tibullus made his am'rous moan;
 Or tender Ovid *, in melodious strains,
 Of love's dear art the pleasing rules explains.
 You, who in elegy would justly write,
 Consult your heart; let that alone endite.

SOAMES.

But as many elegies are of a great length, and do not seem to be calculated for music, they may be ranged on that account under the didactic, or what other rank we please. The sublime Lamentations of the prophet Jeremiah, which M. Arnaud has so happily translated into French, are to be considered as elegies.

XLII. To the lyric gender likewise belongs pastoral poetry, or the songs of the shepherds, and other inhabitants of the fields and forests, and all of this kind that can be accompanied by the flute or haut-boy, the pipe or guitar. Among these rural poems there are,

17. *Eclogues*, a kind of lyric poems, in which are introduced herdsmen, hinds, and other villagers, who entertain each other with their songs, that contain descriptions of a rural and pastoral life. The eclogue, however, is not confined to matters that are merely rustic, but is sometimes extended to other tranquil scenes in a country life; and though the sentiments in these are more refined and more delicate than those of mere husbandmen, yet they should be expressed in the most simple and rural style possible. It is nature alone that must constantly speak in an

* Every one is acquainted with the complaints of Ovid, and the charming elegies of Tibullus; which are models of this kind of poetry.

eclogue: every appearance of art should be carefully avoided.

18. *Idyls* are short gay poems, that contain narrations or descriptions of some agreeable adventure. Those of Theocritus, which may serve as models, contain inexpressible charms, in a style perfectly simple and rural, which made M. Boileau say,

Son tour simple & naïf n'a rien de fastueux,
Et n'aime point l'orgueil d'un vers presomptueux.

His simple, natural turn disdains the verse,
That aught contains of lofty, rough, or fierce.

19. A *villanel* is likewise a sort of pastoral poem that is sung, and the stanzas of which all end with the same line or burden. There are many examples of these in the *Astrea* of M. D'Urfey, and in the *Art of Poetry*, as it is called, of M. Richelet. There are, however, certain authors who think that the eclogue, the idyl, &c. do not belong to lyric poetry: but that is of little consequence. If they chuse to make them a distinct pastoral species, we have no objection. All that we can certainly determine in this matter is, that these poems appear to have been made for music, and that anciently the eclogues were actually sung.

XLIII. 20. The *cantata*, which is an Italian word, and means a piece of poetry, diversified with recitatives, airs, ariettas, duos, &c. They are sometimes made for a single voice, but more frequently, and better, for two. They are susceptible of a great accompaniment; and there are some of them that are witty, gallant, heroic, pastoral, &c. The models of these that are found in Bernier, but especially in Rousseau, evidently shew that the cantata is capable of great poetic and musical beauty, and that it is, perhaps, at once the *chef-d'œuvre* of both arts.

21. *Cantatiles* are short cantatas, the music of which is commonly in the Italian taste.

22. *Serenades* are a sort of cantatas that are to be learned memori er, and to be performed, accompanied with instrumental music, during the obscurity of the night, either for the entertainment or in honour of some particular person. The custom is most common in Spain. All the poetry that is here used is of the lyric kind.

XLIV. Lastly, Religion also sometimes makes use of lyric poetry, to raise the soul to heaven. There are of this kind,

23. *Psalms*, which is a title appropriated to the CL. sacred hymns that are attributed to David; which are full of divine fire; are wrote in a style truly oriental, and abounding with those lively and strong images that are only to be found in the eastern poets.

24. The *canticles* form the text of a spiritual song, by which we testify our joy or glory to God; or render him thanksgiving for some mercy received; or express some sentiment of piety with which our hearts are pierced. They are particularly adapted to the service of the church. One would imagine that there was a peculiar ill fate which attended the German Protestant hymns, as out of that immense number with which their books are filled, there are very few that are exempt from essential faults, either with regard to the versification, the expression, or the thoughts themselves. The most low and wretched ideas, in expressions equally miserable, are there constantly mixed with what there is of good and edifying. We must except, however, all those of M. Gellert, and some few others. It were to be wished, that our best poets would consecrate their talents to this kind of poetry; but they should be filled with the sacred fire of a David; for mediocrity is here altogether insupportable.

25. *Hymns* are a sort of odes that are adapted to be sung in glory of some Divinity. Among the ancients these hymns commonly consisted of three stanzas: one of which was called the strophe, another the antistrophe, and the third the epode.

Hymns of this kind were sung in praise of Bacchus. The church has consecrated the form; and the *Gloria in excelsis* is called the angelic hymn. They are to be found in the breviary; and there are books that are entirely filled with them.

26. *Anthems* are, strictly speaking, only some short portion, or verses of scripture, set to music, and are proper for the church. But we may refer to this class all the grand anthems or compositions that are adapted to spiritual music, or those sacred cantatas or oratorios that the greatest poets have wrote, and that are performed among different Christian nations, both in Lent, and at other times of the year, in order to excite their devotion. Such, for example, is the famous *Stabat mater dolorosa* of Pergelosi; the Death of Jesus; the Joas king of Juda; and various others in all languages, especially in the German, which excels in compositions of this kind.

27. The *noels*, or carols, are also spiritual songs that are designed to celebrate the nativity of the Saviour of the world. But it must be confessed, that the very common use that is made of these noels, by children who sing them through the streets, and on the highways, is an abuse; and moreover, that in these hymns there is frequently a mixture of the sacred and trifling, the edifying and profane, in a manner that does but badly sort with the dignity of the subject.

XLV. The fourth class of poetry is the *didactic* or *dogmatic*; under which are comprehended as its species,

1. All *grand dogmatic poems*, as that of Lucretius on the nature of things, the Anti-Lucretius of cardinal Polignac, the Georgics of Virgil, the Art of War by the philosopher of Sans-Souci, the Art of Poetry by Horace and Boileau, the poem on Religion by the younger Racine, and every other that teaches any doctrine, art, or science.

2. *Poems in verse* that are *merely historical*, where imagination and fiction have no part, and which rather appertain to versification than poetry.

3. *Epistles*

3. *Epistles in verse*, such as those of Horace, Boileau, Voltaire, and other great poets, which are *chefs-d'œuvres*, and models of this kind.

4. *Plaintive epistles* are a sort of elegies, but without fiction, and expressed with that simplicity which is the characteristic of didactic poetry, and in a kind of verse that is not proper for music.

5. *Heroids*, which are imitations of the epistles of Ovid, and are made on the name of some fabulous hero or heroine.

6. *Satires*, as those of Horace, Juvenal, Boileau, &c.

7. *Eulogies* and *panegyrics* that are made, in verse, on saints, heroes, and other illustrious personages.

8. *Complimentary verses* addressed to some Mæcenas, or other respectable character, or to our friends on some solemn occasion, as on their marriage, or natal day: and such are epithalamiums, and other like verses.

9. *Epigrams*, which are a short kind of poems that are applicable to all sorts of subjects, and which ought to end with a thought that is lively, just, and poignant. An epigram may be contained in two lines only, and the last thought, which is called its point, should present a *bon mot*. The design of an epigram is to instruct and to correct the manners by diverting the mind. This however is a rule which the poets do not always observe; for they sometimes use them to satirize or vilify their neighbour; and sometimes also they present images that are very far from having a tendency to correct the manners. Notwithstanding what the epigrams of Rousseau may contain that is licentious, yet every man of judgment must allow, that they are masterpieces of their kind. We shall only add, that the less the didactic is ornamented with fiction, with brilliant thoughts, and striking images, the more distant it is from poetry, and the nearer it approaches to prose.

XLVI. The fifth gender of poetry is that of fables. This is the empire of poetry, the true land of fiction. However, we should take care not to

exceed all bounds, and entirely to lose sight of nature, by making inanimate beings speak instead of animals. M. Despreaux has taken scarce any notice of fables in his Art of poetry, the reason of which is not easy to conceive. A fable is a story, or narration of imaginary incidents, that is calculated to please and to instruct. There are of this kind,

1. *Æsopian fables*, or imitations of the manner of Æsop, whose narration is admirable, seeing that it is simple, natural, just, and, at the same time, brilliant with wit. This father of fables has been imitated, with different success, by poets of all nations, as Phædrus among the Romans, Fontaine and La Motte among the French, Hagedorn, Gellert, and Lichtwehr among the Germans, and numberless others.

2. *Sybaritics*, which are more properly short tales, that are equally ingenious and agreeable, than fables, because they more commonly contain dialogues between men than other animals. An example, taken from Ælian, will give an idea of these. “A scholar
“ was walking with his governor in the streets of
“ Sybaris. They met a man who sold dried figs.
“ The boy stole one of them; for which his gover-
“ nor very severely rebuked him; then took the fig
“ and eat it.”

3. *Miesian fables*, which comprehend also romances of every kind, books of chivalry, amorous adventures, Arabian tales, such as the Thousand and one nights, the Thousand and one days, &c. and also such works as are made in ridicule of these, as Don Quixote, &c.

4. *Heroic fables*, which are intended to form wise and virtuous sovereigns or heroes, by affording them judicious instructions under the figure of a pleasing fiction. Such are the *Cyropædia* of Xenophon, the *Telemachus* of the archbishop of Cambray, the *Neoptolem*, *Memnon*, *Sethos*, the *Retreat of Cyrus*, and many other like poems.

5. *Political*

5. *Political fables*, whose design is to criticise bad maxims of government, abuses in the laws, the manners and customs of a people, and sometimes the foibles of the wise and learned, and to make reason speak by the mouth of some fictitious character. Of this sort are the *Afs* of Lucian; the *Utopia* of Sir Thomas More; the *Poetical City* of the Sun by Campanella; the *Atalantis* of chancellor Bacon; the *Argenis* of Barclay; the *Journey into Caclogallinia*; the *Travels of Gulliver*, by Swift, &c.

6. *Satiric fables*, which are mere satires on the manners of the times, or on some particular class of men in society, as that famous book entitled *Reynard the Fox*; the *Tale of a Tub*, and the *Battle of the Books*, by Swift; the *Subterraneous travels* of Nicholas Klimm of Holberg; the *Monarchy of Solipses*, against the Jesuits, and many German works by Liscow, Rabener, &c. There is scarce any nation that has not furnished models of this kind.

7. Lastly, *Tales*, as the hundred new tales of Bocace, the tales of Fontaine, Hagedorn, Gellert, and numberless others in all languages. All these fables and tales belong doubtless to poetry, although they may be wrote in prose.

8. *Moral tales*, whether in verse or prose. Those, which M. Marmontel has lately offered to the world, are highly pleasing, and merit all the applause they have received.

XLVII. There is a sixth class of poetry, but which is much inferior to all the other, and consists in torturing genius and art to produce gaudy trifles. We scarce know what name to give this kind of poetry, as it is nothing more than a play with words, or at most with wit, and whose performances afford but little entertainment to men of true taste. If any thing can render these pieces tolerable, it must be the happy incidents, an extreme propriety, and a certain easy turn that seems to be the effect of nature, without the least assistance from art. Of this kind are,

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1. *Anagrams*, which consist in transposing the letters of some name in such manner, that at last by the aid of various combinations, they make of it some other word, either to the reputation or disgrace of the person to whom the name belongs, and which is further improved by applying it to some epigram. Sometimes they also turn complete phrases into anagrams. Colletet says of the fabricators of anagrams,

Sur le Parnasse nous tenons,
Que tous ces renverseurs de noms
Ont la cervelle renversée.

From Parnassus we proclaim,
That each turner of a name
Is surely turned in his brain.

2. *Acrostic* is a poem of which each line begins with the letters of some name, in their regular order. Sometimes also, to make it more remarkable, echoes are added to the end of each line. It is easy to conceive how much a poetic genius must be cramped by such verses as these.

3. *Chronostics* are small verses or inscriptions, devices, &c. which include, in their letters, some number in Roman characters, as the date of the year, some person's age, &c.

4. *Logogryphs*, which contain a sort of symbol in an enigmatic expression. They consist of some equivocal allusion, or mutilation of words, which occasions the literal sense to differ from the thing signified: so that the logogryph takes place between the rebus and the true enigma.

5. *Enigmas* are a kind of propositions that are given to be explained, and that are couched in terms that are obscure, ambiguous, and frequently in appearance contradictory. This is the masterpiece of low wit, and naturally belongs to periodical works of poetry.

6. *Bouts*

6. *Bouts rimez* are a number of rhimes that are uncommon, and which appear to have the least connexion with each other, that are given, together with a subject, to the poet, who is to supply verses that are to end with those rhimes in the order they are given. Whoever has the least idea of the spirit of poetry, and of that liberty which is so essential to genius, must be sensible how much such fetters as these must gall the mind, and how miserable an employment the drudging at such verses must be; though caprice has, and will continue at different times to make it a fashionable amusement.

XLVIII. The seventh and last gender of poetry is that in which the imagination of the poet is employed in inventing inscriptions, emblems, epitaphs, ciphers, those verses that are placed beneath portraits, epigraphs, that is, sentences which are taken from some celebrated author, in order to be placed at the head of a work of genius, and which the Italians call mottos, &c. From this sort of subjects has arose the style that is called *lapidary*, and which is particularly appropriated to inscriptions. It holds a place between verse and prose, and should not be either very plain or very brilliant. Cicero has prescribed its rules: *Accedat oportet oratio varia, vehemens, plena animi, plena spiritus. Omnium sententiarum gravitates, omnium verborum ponderibus est utendum.* This lapidary style, which seemed to have perished with the monuments of antiquity, has been revived with success at the beginning of this century, and the poet Santeuil has excelled in these subjects.

XLIX. After having thus described all the genders and particular species of poetry, in the analysis of which we have well nigh exceeded our bounds, though we have confined ourselves to a very cursory description of their various matters, we shall finish this chapter with some essential and indispensable reflections on poetry in general, and on the character of those who would excel in this art. We cannot avoid again desiring the reader to reflect here, as well as in
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all that we shall further say of the polite arts; on what is contained in the first chapter of this book.

L. If it be true that poetry is the art of expressing fine thoughts by fiction, it follows that the poet should be capable of producing fine thoughts, and of inventing ingenious fictions. Fine thoughts are the fruit of a mind that is clear, strong, sagacious, stored with useful and ornamental learning, of a philosophic turn, of a sound judgment, consummate experience, and replete with numberless reflections. Fictions are the children of a lively imagination, of a genius highly animated, and that knows how properly to employ every image that the mind and a happy memory can present. The young, the weak, or ignorant, are therefore incapable of producing such thoughts as can either instruct or entertain the wise: and old men, loitering in the vale of years, lose insensibly that vivacity of imagination which is so necessary to produce happy fictions; the snow, that covers their heads, extinguishes the fire of genius: the mind loses with the body its prolific virtue. Immense plains surround the feet of Parnassus; and the temple of Immortality is fixed upon its summit. Youth should attend, in these plains, the age of reason, when they will be enabled to ascend the forked hill; and, while they wait, should drink plentifully of the waters of Hippocrene. The aged, who have happily attained the summit, should take their place in the temple, there enjoy a glorious repose after their labours, and serve as judges of the present age, and models to posterity. They who enjoy the strength of days, those men of brilliant genius who still pursue the bright career, should sometimes politely stretch the hand to assist the labouring youth; or the charming sex, when they abandon all other advantages to obtain the poetic laurel, and who always so happily substitute an inimitable delicacy in the place of manly strength. But far from Helicon be those churlish critics, those morose journalists, whose dull pedantry is calculated to destroy every effort of genius: who have not sufficient sensibility

sibility to perceive, that one bright and charming thought outweighs a long methodical poem; that there are certain happy negligencies in poetry; and that verses so correct, that the critic can find no fault, are commonly void of fire, and infamously wretched.

LI. We have explained, in the eighth section of the first chapter, what we understand by the word *taste*. The poet should endeavour to improve it during his whole life. The great models of antiquity, and of modern Europe, are highly proper for that purpose; but a rational discernment is still more advantageous. Disciples of Apollo! who live in the eighteenth century, and in the bosom of Europe, do not always attend to the hoarse voice of pedantry, nor think that all is gold which shines in antiquity. Do not imagine that Hebraic, Oriental, Grecian and Roman beauties are universally applicable to all ages and all climates: be satisfied that the ancients were not incessantly excellent; on the contrary, they frequently erred; and their works every where discover those imperfections which are so natural to the first productions of every age whatever. Be persuaded that there are still many thousand new paths by which you may attain the summit of Parnassus. Think therefore for yourselves; and constantly remember for what age, and what people you write; consult your reason, and observe what is contained in the following paragraphs.

LII. In the first place, consult nature. For the *imitation of nature* is one of the principal precepts you learn from art. Never lose sight of her during the whole course of your labours. Without her your productions will be at best but glaring, and constantly extravagant. But do not imitate her in too servile a manner: for your imitation must not be that of mere nature. It is not necessary, for example, that your shepherds be cloathed in rags; that they feed on mouldy bread, and talk in the meanest language. You are therefore not to imitate the whole of nature; but to avoid every object that is gross, brutish and disgusting. Constantly remember that
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the intention of all the fine arts is to give pleasure ; and therefore never present any object that is gloomy or disagreeable, without some other that may serve as a proper corrective. You should even embellish nature in all her objects ; but take care not to render her ludicrous by the ornaments you give her.

LIII. The *marvellous* in poetry must also be subject to nature. It is drawn sometimes from the nature of the gods, of genii, fairies, spirits, or demons, and their powers ; and sometimes from the wonderful actions of great men ; or from the extraordinary phenomena of nature herself ; and sometimes from animals, and the fabulous powers which are attributed to them. All these form that *machinery* which the poet makes use of to strike, to affect and fix the attention of the reader, when the natural powers which should produce those effects appear to the writer insufficient ; or when he thinks that he has exhausted them. But, as we have already said, the gods, elements, men, and other animals, vegetables, and other inanimate beings, have each their peculiar nature, of which they should never be divested, when we make them act or speak. Every sort of marvellous, that exceeds those limits, is extravagant and absurd.

LIV. But by this rule itself you are taught, that it is allowable, and frequently even necessary, to substitute *appearance* in the place of reality, according to the judicious precept of Horace,

Pictoribus atque poetis
Quidlibet audendi semper fuit æqua potestas.

Provided, however, that you at no time exceed the bounds of probability, and do not produce monsters, chimeras, beings that have no existence in nature.

LV. Lastly, endeavour that your thoughts be at all times clear, natural, noble, and, if it be possible, sublime. We shall give some further useful rules relative to a poetic expression of our thoughts in the following chapter on versification, or the mechanism

chanism of verses, as that is the proper place. You will there find remarks on style, and on all that is called poetic beauty. These rules are dictated by reason; and whoever aspires to excel in the art of poetry, ought not to be ignorant of them. And you favourites of heaven! you who are endowed with a sublime genius, who have received from nature, at your birth, the seeds of all the polite arts, the powers of inventing and producing the most finished compositions, give the reins to your brilliant imaginations! launch boldly forth in the career of glory! fly rapidly o'er those trifling impediments that stop or o'erthrow the man of little genius: read these rules, but do not at all times remember them in your practice.



C H A P. VII.

ON VERSIFICATION.

I. **V**ERSIFICATION has in some respects the same relation to poetry that rhetoric has to eloquence. As poetry commonly makes use of verse in its expression, it is necessary to understand the mechanism of its construction. By verse we understand a certain connexion of periods, the words of which are measured by feet or syllables, in order to form a sonorous and harmonious expression. We have already remarked, in the preceding chapter, that there are found, among all ancient and modern nations, traces of poetry, even from their very origin: and what is still more remarkable, the most ancient proverbs or sentences, that contain such universal truths as have made them of common and constant use, are almost all in rhyme; which has given occasion to many conjectures concerning the origin of versification in general, and of rhyme in particular.

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II. The ancients did not usually make their verses in rhyme, but measured them by long and short syllables, which they *scanned*. Modern nations have not all observed the same method; and I think a very natural reason may be given why they have not. Men in the first ages of the world had but few wants, little knowledge, and little commerce with each other, and consequently but few words in their phraseology. They endeavoured to express their thoughts by language, and, in order to make themselves more easily intelligible, they took sufficient time to distinguish their syllables into long and short. All the eastern nations were inclined to taciturnity: the Turks, their successors, are so at this day, and serve as an example. The Greeks and Latins were very far from speaking with the same volubility as do the French and English, and they had not near the same number of words as the moderns have to express their thoughts: it is only necessary to compare the several dictionaries in order to be convinced of the difference. It may be proved, moreover, by many unanswerable arguments, that all the ancient people, especially the Greeks and Latins, had long and short syllables very distinguishable, precisely determinate, and that, by a caution which degenerated into a habit, they employed exactly twice the time in pronouncing the long, that they did in the short. Such was their dialect, their pronunciation, their peculiar accent. The changes and regular combinations of these syllables distinctly long and short, naturally formed a cadence, a measure, regular verses. That was sufficient. The language, which consisted of measured periods, was distinguished from the common language, and applied to poetry; thus the first verses, of which we have any knowledge, are not wrote in distinct lines, but in continuance, like ordinary prose.

III. In proportion as the human mind advanced in knowledge, as the original arts were improved, or as new ones were invented, as men had more connexion and intercourse with each other, the increase of words became

became inevitable, as the number of objects they were to express were greatly augmented: the necessary consequence of which was, that conversation became more voluble; and, in fact, modern nations, from reflection, and by habit, have introduced a pronunciation so rapid as totally to destroy all that accurate distinction of long and short syllables which was observed by the ancients. Whoever attends to the common conversation of the English, French, Germans, &c. will be easily convinced of this truth. A studied discourse, where the speaker should endeavour precisely to mark the long and short syllables, would now appear highly affected and insupportably tedious. The fluency of modern languages will not therefore admit, either in prose or verse, of the methodical cadence of the ancients. We should not suffer ourselves to be seduced in this respect by those abuses which are sometimes introduced even at court, in the capital, in an academy, &c. Formerly they said at Paris *un bâton*: some *petits maitres* have called it, by affectation, *un bâton*, and that pronunciation is now almost established; people of sense frequently contributing to bring that vicious practice into a precept. We should well remember, that it is ever an essential imperfection in a modern language to dwell too long upon the syllables, as it thereby becomes drawling. This kind of abuse, which, however, seldom lasts long or infects the provinces, cannot alter the general and natural rules which are founded in nature.

IV. On the other hand, to avoid that tedious uniformity which would arise from a language constantly of the same measure in all its syllables, modern nations have varied and distinguished them by *accents*. But these accents do not distinguish the time by resting a longer or shorter space on each syllable, but by an inflexion of the voice more or less strong on the different letters or syllables. Properly speaking, there are not therefore in modern languages any sensible distinctions of long and short syllables, but many that are to be lightly passed over, and others on which a strong

strong accent or inflexion of the voice is to be placed. We should take care, therefore, not to confound our accented syllables with the long and short syllables of the ancients, as they are, in fact, very different.

V. When modern poets began to perceive, that a just distinction of long and short syllables was not to be made in their languages, they were obliged to invent a new character for their verse, such as was sufficient clearly to distinguish it from prose: this character they found in rhyme; and, in fact, the expedient was a very happy one. For, in the first place, rhyme serves, as we have said, to characterize verse; secondly, to please the ear by a certain harmonious concord, but such as is continually varying; thirdly, it offers to the reader one difficulty more that the poet has to overcome, in order to promote his pleasure, and in this he constantly finds a secret satisfaction; fourthly, it is a help to the memory, as all actors agree, that verses with rhymes are far more easily retained than those without: and lastly, it is of use, especially in long poems, to prevent the disagreeable monotony of metre, which would be insupportable without rhymes.

VI. The modern restorers of verse without rhyme, and particularly of hexameters, have submitted to a strange illusion. They have been told, that "such beautiful verses have been made with rhymes, that we should not now think of throwing off that happy yoke." They reply, that rhyme gives so great an uniformity to verse, as to become insufferable in poems of great length, as, for example, in an epopea. Strange error! The scansion of verses, that are cadenced by the measure of feet, forms a kind of melody; and it is certain, that the ancients had a musical rhythm for their verses without rhymes (see fig. 1.). Now where is the ear that can suffer this continual monotony, this musical rhythm, the same melody of declamation always in the same tone, or in any other melody whatever, but constantly uniform, in an epic poem of five or six thousand verses, or in tragedy, comedy, &c.?

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past my comprehension; and if, for example, I am not furfeited, even with the beautiful versification of the *Æneid*, it is because my mind is continually relieved by the charms of the ideas. In proportion also as these poems are regularly declaimed, according to the exact rules of the prosody of the ancients, the monotony is the greater, and they become more insipid; and the only method of making them sufferable to modern ears, is to break the verse, and to pronounce them in such manner that the cadence may not be perceived, but that they may resemble prose. But where then is the scansion? What becomes of the long and short? Mere imaginations!

VII. Rhymes, therefore, were very properly invented to prevent the monotony, or at least to avoid an insufferable uniformity; for they are susceptible of an almost infinite variety, as is evident from the Dictionary of rhymes by Richelet, a book of 750 pages octavo, in a small character, and which, nevertheless, contains only a part of the rhymes in the French language. The continual variation of their masculine and feminine rhymes still further augments this agreeable variety. Therefore, all the French poets, from Stephen Jodelle, who lived in 1553, down to the late M. de la Motte, who have tried to compose blank verse, have miscarried wretchedly. I would say almost as much of the poets of other nations, if I were not fearful of shocking prejudices too strongly established, and of incurring contradictions that frequently give rise to acrimonious and illiberal disputes. Be that however as it may: in the French language, the lamentable example of the greatest men, and the reason of the thing itself, should intimidate poets from engaging in such fruitless essays, as they may be persuaded that this language (as well as English and German) is not adapted to the making of verses whose whole cadence consists in long and short syllables; for such distinction does not there properly exist, and, without the modification of rhyme, there is little probability of succeeding in any measure whatever. We shall not enter here into any further

further disquisitions concerning the utility and origin of rhyme, and the more, as we leave to the critics all learned researches, equally curious and insignificant, concerning the dates, the epochs of all matters whatever. It is sufficient for us that these things exist, and that they are necessary.

VIII. But beside rhyme, there is a necessary cadence to be observed in all verses, and which arises from the mixture of syllables that are accented or not accented; and this it is which produces the measure in all modern verses; a measure that is founded on the prosody of each language. The French nation, and foreigners still more, have an essential obligation to Abbé d'Olivet, for having furnished them with so excellent a prosody. We cannot read this ingenious work however, (nor any other treatise on French versification) without saying to ourselves, how is it possible for a nation so delicate in these matters, and who make such accurate, such metaphysical distinctions between an *E* more or less open or close, to suffer their poets to violate the first principles of prosody, so far as not to pay any regard either to feet or scansion in their versification? For though there are not, as we have repeatedly said, in most modern languages, either long or short syllables, strictly speaking, yet there are, in all these languages, syllables that have accent, and others that have none: and from the different combinations of these arise feet and measure, which are to be determined by scansion. Now the recision of the feet, and want of regard to scansion, produce, among the greatest poets, verses that are manifestly faulty. I shall give one instance only, which I just now met with in the *Iphigenia* of the illustrious Racine.

La colère des Dieux demande une victime.

According to all the rules of prosody and scansion, the syllable *le* in *colere* should be short or acute in this verse; but it is accented with all the rigour of its natural pronunciation. In the word *une* the accent should

should repose on the *u*, and the syllable *ne* be short or acute ; but here it is precisely the contrary ; and to make the verse in any degree tolerable, we must pronounce it *unai victime*, or very near it. All the best French verses are strewed with these little imperfections, which are particularly disagreeable to the ear of a foreigner. But do not, Germans, who may read this, remark the mote that is in your neighbour's eye, and not see the beam in your own eye. Purge your verses from their hiatus, or gapings, from trite and low expressions, &c and then blame this prosodiac negligence of the French. For you must allow, that notwithstanding these small imperfections, the French poetry is formed to charm every man of taste. A little more correction would render it perfect.

IX. As we do not write for the French alone, but wish that our efforts may tend to a more general utility, it will be proper to shew here the several sorts of verse in the Latin poetry, and which serve as models for the versification of many modern nations ; who still think that they have in their languages the determinate long and short syllables of the ancients. But, before we make the enumeration of these, it will be expedient briefly to explain some particulars which may serve to facilitate the understanding of these matters. We must therefore observe that the sign (-) denotes a long syllable, and (◡) one that is short ; that every Latin verse is composed of a certain number of feet, and each foot of a certain number of syllables ; that these syllables are either long or short ; and that the measuring of these verses, according to their feet, is called *scansion*. The feet, which are also called *metra*, are of two, three, or four syllables. There are four kinds of feet of two syllables, which are, 1. The Spondee, composed of two long syllables, (--) as *laudes*.

2. The Pyrrichius, composed of two short syllables, (◡ ◡) as *bene*.

3. The Trochee, or Choreus, of one long and one short syllable, (- ◡) as *astra*.

4. The

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4. The Iambic, of one short and one long syllable, (u -) as *pios*.

Eight sorts of feet of three syllables, which are,

1. The Dactyle, composed of one long, and two short syllables, (- u u) as *tempora*.
2. The Anapæstus, consisting of two short, and one long syllable, (u u -) as *animo*.
3. The Molossus, of three long syllables, (---) as *gaudentes*.
4. The Tribrachys, of three short syllables, (u u u) as *diminus*.
5. The Amphibrachys, of one short, one long, and one short syllable, (u - u) as *latinus*.
6. The Amphimacrus, or Creticus, of one long, one short, and one long syllable, (- u -) as *cogitans*.
7. The Bacchius, of one short, and two long syllables, (u - -) as *dolores*.
8. The Antibacchius, of two long, and one short syllable, (- - u) as *peccata*.

Sixteen sorts of feet of four syllables, which are,

1. The Proceleusmaticus, composed of four short syllables, (u u u u) as *frigilibus*.
2. The Dispondeus, composed of four long syllables, (- - - -) as *interrumpens*.
3. The Antispæstus, of one short, two long, and one short syllable, (u - - u) as *inardescit*.
4. The Choriambus, of one long, two short, and one long, (- u u -) as *interimens*.
5. The Dijambus, of one short, one long, one short, and one long, (u - u -) as *severitas*.
6. The Ditrochee, of one long, one short, one long, and one short, (- u - u) as *principalis*.
7. The Ionic minor, of two short, and two long, (u u - -) as *generosi*.
8. The Ionic major, of two long, and two short, (- - u u) as *enormiter*.
9. The first Epitritus, of one short, and three long, (u - - -) as *Salutabant*.
10. The second Epitritus, of one long, one short, and two long, (- u - -) as *comprobabant*.

11. The

11. The third Epitritus, of two long, one short, and one long, (-- ◡ -) as *nutricii*.
12. The fourth Epitritus, of three long, and one short, (- - - ◡) as *circumspexit*.
13. The first Pæon, of one long, and three short, (- ◡ ◡ ◡) as *virgineus*.
14. The second Pæon, of one short, one long, and two short, (◡ - ◡ ◡) as *poeticus*.
15. The third Pæon, of two short, one long, and one short, (◡ ◡ - ◡) as *manifestus*.
16. The fourth Pæon, of three short, and one long, (◡ ◡ ◡ -) as *misericors*.

X. From the different arrangement of these feet, whose names and kinds should be well remembered, arise the several sorts of Latin verses, as well as Greek. The several kinds or genders of verses, or poems, are either simple or compound. The simple are the nine following: 1. Hexameter, which comprehends as species, 1. the Adonic. 2. The Phœreatic. 3. The Archilochian. 4. The heroic Tetrameter. 5. The Alcmanian Dactyle. 6. The Ithyphallician Dactyle.

2. Pentameter.
3. Anapæstic.
4. Sapphic.
5. The Phalæcian.
6. The Iambic, which comprehends as species, 1. the Scæzon, and 2. Anacreontic.
7. The Trochaic, which comprehends the Hyphallic.
8. The Choriambic, comprehending as species, 1. The Aristophanic. 2. The Glyconic. 3. The Asclepiadic. 4. The Alcaic, &c.
9. The Ionic minor.

The compound genders arise merely from the different combinations of the simple genders, which the ancient poets have made use of in various ways as they found convenient, in order to give the more grace to their poems, as in elegies, &c. from whence have arose the titles of *carmen monocolon*, *dicolon*, *tricolon*, &c. The good Latin prosodies shew the particular composition of all these different genders of verse ;

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what are the words that enter into each kind of feet, and what are the feet, and consequently the words that compose each gender and each species of verse. It is impossible, however, for us to enter into these details: we shall, therefore, return to the versification of modern nations, and, in particular, that of the French.

XI. The French verse, therefore, is not composed of feet, but syllables, and consequently is not scanned but measured by such of them as are either accented or not accented. The French word *mesurer* has been substituted in the place of the Latin *scandere*, which signifies to climb or mount, and does not seem so well to express what we intend. There are verses of twelve, ten, eight, seven, or six syllables, and still less; of which examples may be found in all the treatises on versification. All French verses are divided into masculine and feminine: those which finish with a silent e, or other syllable whose sound is so weakly pronounced as not to make any determinate impression on the ear, are called feminine, and have always one syllable more than the masculine of the same sort; but this syllable, whose sound is scarce to be perceived, is not reckoned. The masculine verses are those which end in any other manner whatever by a fixed termination, and consequently have no superfluous syllable that is drowned in the pronunciation.

XII. It seems to us, that neither M. Despreaux, nor any other author who has wrote on versification, have had a just idea of the *cæsura*, when they say, that it is a pause which cuts the verse into two parts. *Cæsura* comes indeed from the Latin *cædere*, which signifies to cut, but is not restrained to the cutting of a verse precisely in the middle, and reducing it to two hemistichs or half lines. Among the Latins, the *cæsura* cut every foot; and this is so certain, that they have added an epithet to mark at what syllable it cut a word in order to make the foot; and thus they said *cæsura trithemimeris*, *penthemimeris*, *hepthemimeris*, *ennethemimeris*. For it is by no means
necessary

necessary that feet be composed of entire words, as the last or penultima syllable may very properly begin a new foot: and this even gives a grace, a remarkable volubility to verses, that would become hard and rough if each foot was to end a word. It is this that makes the following verses of Virgil so sonorous and beautiful:

Una salus victis, nul-lam spe-rare sa-lutem.

And

Infandum, regina, jubes renovare dolorem.

And though there are not, as we have already observed, any regular feet in the French poetry, there is, however, a measure that is equivalent, or a rhythm that is derived from syllables accented and not accented. Now it is proper to recommend to the young poet to observe, even in French, the rule and example of the Latins, and to make the cæsura of this measure fall as much as possible on the middle of a word, and not at the end; which will give a pleasing harmony to his verses, and render them at the same time more flowing. We shall give one example from the illustrious Racine. Agamemnon says, in Iphigenia:

Ma fil-le attend encor-mes or-dres sou-verains.

The cæsura falls here almost every where on the middle of a word; and this excellence, joined to the elision in *fill'at*, renders this verse admirable. There is, therefore, beside the cæsura which marks the pause in a long verse at the middle of the line, a second cæsura for the rhythm.

XIII. M. Despreaux says, speaking of the cæsura in French verse,

Que toujours dans vos vers—le sens coupant les mots,
Suspende l'hémistiche,—en marque le repos.

For ever let the sense—the words in half divide,
Suspend the hemistich—a pause distinct provide.

It will be easily perceived, that these lines, which have been so much admired, prove nothing; or rather, that they prove the contrary of what is intended, if we reflect on what has just now been remarked concerning the *cæsura*, and if we consider that *hemistic* is a Greek word, which signifies half a verse. What is then, according to this idea, *a sense that cuts the words? a cæsura that suspends the demi-verse, or demi-line?* The word *suspend* appears here improper and ambiguous. It should be said, that the *cæsura* marks a repose in the middle of the verse, and divides it into *hemistics*, as a globe, which is cut through the middle is divided into *hemispheres*. According to the rules of French versification, however, the principal *cæsura* is to be placed, in verses of twelve syllables, after the first six; and in those of ten syllables, at the end of the fourth. It is asserted, that other verses have no *cæsura*. Particular rules for these matters are to be found in all the treatises on French versification, especially in that which M. Richelet has placed at the head of his Dictionary of rhymes; in that of M. Restaut, and many others.

XIV. When two vowels come together in a verse, and the one does not drown the other in the pronunciation by means of an elision, it is called an *hiatus*. This is an egregious fault; one that shocks every ear, which has the least delicacy, and therefore ought carefully to be avoided. M. Richelet gives the following example from the *Quadrans* of Pybrac:

Dieu en courant ne veut être adoré,
D'un ferme cœur il veut être honoré;
Mais ce cœur là, il faut qu'il nous le donne.

God will not be ador'd with hasty prayer.
With upright heart must man proclaim his deeds,
But 'tis from Him alone the upright heart proceeds.

Dieu en and *la, . il*, make hiatus that are unpardonable.

XV. When a sentence begun in one line is carried into the next, and another sentence is begun before the

the end of the second line, it is called an *enjambment*.
The following examples are taken from Richelet :

Mais de ce même front l'héroïque fierté
Fait concoître Alexandre. Et certes son visage
Porte de sa grandeur l'infallible présage.

RACINE.

But of that front the stern heroic look
Shows Alexander. And sure his visage
Bears of his dignity the certain presage.

A l'aspect de son roi, le vaillant capitaine
Bayard, quoique blessé, combattoit dans la plaine.

At the sight of his king, the valiant captain
Bayard, though wounded, still fought on the plain.

These enjambments are real faults ; but they are such as the most able poets do not always avoid. The limits of this work will not allow us to give their reasons for using them ; they are fully explained in all the treatises on versification. We can here only point out those rocks which are to be shunned, and trace such rules as are most essential.

XVI. *Transpositions*, or *inversions*, consist in changing the natural order of the words, as in the following verses :

A mes justes desseins je vois tout conspirer,
Des sottises du temps je compose mon fiel,
Il veut sans différer ses ennemis combattre.
Et si quelque bonheur nos armes accompagne,
Vous direz à celui qui vous a fait venir,
Que je ne lui saurois ma parole tenir.

To my just projects all I see conspires.
Of the times follies I compose my spleen.
Without delay his foes he will engage,
And if good fortune shall our arms attend.
To him declare, who hither has you sent,
That I, my promise made him, cannot keep.

It is certain that these transpositions serve not only to facilitate versification, but to give it also great strength and grace. M. Cerceau thinks them so ne-

cessary, that it would be impossible to make French verses without them. However, they are to be used with discretion ; and we should take particular care that they do not appear to be made by necessity.

XVII. *Rhyme* is the same sound at the end of those words with which verses are terminated. We say the same sound, and not the same letters ; for rhyme is made for the ear, and not for the eye ; therefore, in all doubtful cases, the ear is to decide, that being the rightful judge. We have so often mentioned this article, that to avoid repetitions we shall here only add, to what has been already said, that rhymes in French are either masculine or feminine. In the masculine it is the last syllable that makes the rhyme, and in the feminine the two last ; as,

Mas. { A de nouveaux exploits Mayenne est préparé,
D'un espoir renaissant la peuple est enivré.

Fem. { Ces momens dangereux, perdus dans la mollesse,
Avoient fait aux vaincus oublier leur foiblesse.

When the last syllable in masculine rhymes, and the two or three last syllables in feminine rhymes, are exactly the same both to the eye and the ear, they are called rich rhymes. For the rest, there are in the French versifications great niceries with regard to rhyme, which are derived from the different pronunciations of the same letters of the alphabet, and from whence it frequently happens that the same letters do not rhyme to each other. For all these matters, the treatises on prosody and versification are to be consulted, and from thence are to be learned the particular rules, such as, 1. What are the cases where the same letters do not rhyme ; 2. in what cases different letters rhyme, by giving the same sound to the ear ; 3. if the simple and compound can rhyme to each other ; 4. that the rhyme of the two LL, of which one is hard, and the other liquid, is bad ; 5. if a word can rhyme with itself ; 6. that the rhyme of accented syllables, with the same syllables that are not accented, is bad ; the cautions that are to be observed with re-
gard

gard to the rhyming of monosyllables; 8. that the verse is faulty, when the first hemistich rhymes, or nearly rhymes, with the last or with the first hemistich of the following verse; 9. that the singular cannot rhyme with the plural, &c.

XVIII. The *interchange of rhymes* is an object, with the rules of which the poet should make himself well acquainted. He should know, that in regular French compositions it is not permitted to put more than two masculine or feminine rhymes together; that according to the poetic ordinance, rhymes are divided into *continued*, *alternate*, and *intermixed*; an epic poem, a tragedy, a comedy, an elegy, or eclogue, is composed of continued rhymes; an ode, a sonnet, a rondeau, a ballad, &c. of alternate rhymes; fables, madrigals, operas, &c. of mixed rhymes; that it is allowable to begin and end any poem whatever either with a masculine or feminine rhyme, &c. Lastly, that he should avoid all antiquated rhymes, unless it be in a burlesque, marotic, or ludibrious style.

XIX. We shall not say much here relative to the poetic style, as we have already occasionally spoke of it in more than one place. It is a mistake, moreover, to imagine that there is a style, which is altogether peculiar to poetry. M. Voltaire has clearly shewn; that the expressions *fine star*, *fatal laurel*, and a hundred others, which were formerly regarded, not only as poetic phrases, but poetic beauties, are nothing better than tinsel, in verse as well as prose. The grand precept is, that the writer should adapt his style to the nature of his subject, and the poem he would compose. It is to be observed at the same time, that poetry admits of somewhat more elevation, and more ornament of style, and consequently of more metaphors, allegories, and other figures, than prose. But, on the other hand, it forbids the use of all low, vulgar, and trivial phrases, all ambiguous expressions, every thing that is mean, indecent, or disgusting. For example, the words horse, cow, hog, and such like, can never be admitted into good French poetry;

and therefore they substitute in their stead those of courser, lo, &c. For the rest, we cannot sufficiently lament, that the continual alterations in modern languages are attended with so great an inconvenience, that the most beautiful, the most excellent of modern poets, cannot flatter themselves with writing for posterity; that the style of Malherbe, and the great Corneille, illustrious names! is already superannuated, and scarce intelligible. Who knows what will be the fate of the most finished writers of our day? Were we, however, to propose a model for style and versification, we would chuse M. Voltaire: for we know of no *poetic colouring* more beautiful than his; and it is this colouring in which the charms of verse consist: for

Non satis est pulchra esse poemata, dulcia sint.

It remains, to finish this chapter, to explain, by short precepts and examples, the structure of the different kinds of poems that we have indicated in the preceding chapter.

XX. The majesty of the epopee seems to require long verses, such as those called Alexandrines and Heroics, or of twelve syllables *. The *Henriade* alone may here serve as an example. In all probability a more noble species, more proper to express grand sentiments, and form brilliant descriptions, will never be invented. It is, in our opinion, no small imperfection in that excellent poem, the *Jerusalem Delivered* of Tasso, that it consists of stanzas of eight verses, which they call octaves, and that its rhymes are almost all feminine; for these give it a mean, enervated, and languid tone. The first strophe is sufficient to shew how disagreeable this species must be in so long a poem.

* This is meant of French poetry, which in heroics almost always consists of twelve syllables; and though these verses may seem tedious, yet by their manner of pronouncing them, by constantly making a pause near the middle of each line, they have a very different effect.

Canto l'arme pietose e'l capitano
 Che'l gran sepolcro libero di Christo;
 Molto egli opro col senno e con la mano
 Molto soffrì nel glorioso acquisto:
 E in van l'inferno a lui s'oppose e in vano
 S'Armo d'Asia e di Libia il popol misto
 Che il Ciel gli diè favore, e sotto a i fanti
 Segni ridusse i suoi compagni erranti.

Am s and the chief I sing, whose righteous hands
 Redeem'd the tomb of Christ from impious bands;
 Who much in council, much in field sustain'd,
 'Till just success his glorious labours gain'd.
 In vain the powers of hell oppos'd his course,
 And Asia's arms, and Lybia's mingled force;
 Heav'n bless'd his standard, and beneath his care
 Reduc'd his wand'ring partners of the war.

MR. HOOLE.

Perhaps Tasso foresaw, by a spirit of prophecy, that the people of Italy would one day sing his verses, and that he consulted their convenience in the use he made of the lyric kind: this, however, is not an adequate reason for the practice, as the lyric has not sufficient gravity for the epopee, and as a poem of so many thousand verses is improper to be sung. On the other hand, we have in Germany epic poems whose verses are still longer than the Alexandrine, even some of sixteen or seventeen syllables, which they call iambics of eight feet. But these are altogether drawling, and become insufferably tedious by their length. Alexandrine verses are also very proper in a comic or burlesque poem, such as the *Lutrin* of Boileau, as well as in dogmatic or didactic poetry: thus the philosopher of Sans-Souci begins his poem of the *Art of War* with the following lines, addressed to the prince of P——.

Vous qui tiendrez un jour par le droit de naissance,
 Le sceptre de nos rois, leur glaive & leur balance;
 Vous le sang des héros, vous l'espoir de l'état,
 Jeune prince, écoutez les leçons d'un soldat,

Qui formé dans les camps, nourri dans les alarmes,
Vous appelle à la gloire & vous instruit aux armes.

By birth decreed the regal state to bear,
'The sword and balance of our kings your care ;
From heroes sprung, on you our hopes depend,
Young prince, a soldier's lessons now attend,
Who, form'd in camps, and bred amidst alarms,
'To glory calls you, and prepares for arms.

XXI. The Alexandrine verse of twelve syllables is also most proper for tragedy and serious comedy. M. Voltaire has made a happy use of dissyllable verses in his *Enfant Prodigue* ; and others have attempted to compose comedies of alternate, mixed, or irregular verses. There is, however, always great danger in imitating these examples ; though a diction that approaches the nearest to prose, seems to be the most natural for this kind of drama. Suppose a Chinese, who was a man of discernment, should come into Europe, and they should say to him, " Most of the European nations have two sorts of languages : one of them has a regular cadence, that is governed by the syllables, of which each line has a determinate number, and ends with a word, whose sound exactly corresponds with the word that ends the following line, and which sound is called rhyme. This method of writing or speaking is called *verse*. The other manner of speaking is quite natural and simple, and is called *prose* : and of this we make use in the common intercourse of life, in writing, in the pulpit, and at the bar, in public harangues, and in literary correspondence, &c. We have, moreover, public entertainments, in which are represented some heroic action, or remarkable and fatal event, that has happened to some prince or other illustrious personage ; and this we call a *tragedy* : and at other times we represent some pleasant adventure, but simple and natural, that may have happened to private persons ; and these our poets season, by the mouth of the actors, with sallies, repartees, and ingenious reflections, in order to correct our manners, by shewing the

the ridicule of our vices ; and this we call *comedy*. Now, which of these two languages do you think most proper for these entertainments, especially for comedy ; verse or prose ?" It is to be imagined he would say, " If in these representations you would approach as near as possible to nature, make use of that language which is most natural, that is, of prose." But if he was to be told again, that verse serves to assist the actor in retaining and performing his part, and the auditor in remembering what he has heard, and that it is, moreover, of use in reducing the fallies, repartees, &c. into a sententious form, it is to be supposed he would say, " Do that which you find most convenient ; there are here arguments pro and con ; your judgment and experience must direct you : but in all you do, keep nature in view as much as possible."

XXII. We are now come to the lyric species. The ode, divided into strophes or stanzas, makes use of all sorts of verses, from those of four or five, to those of twelve syllables. Its rhymes are sometimes continued, sometimes alternate, and sometimes irregular. The choice of the sort of rhyme depends on the poet, whose taste and judgment are to determine what kind of verse is most consentaneous to the nature of the subject, and the species of ode he intends to compose. Thus there are Sapphic, Anacreontic, and Pindaric odes, in imitation of those celebrated poets of antiquity, and which require very different kind of verses. The odes in prose, of which M. de la Motte has given us specimens, are altogether abominable. We shall here give some examples of French odes.

Juges insensés que nous sommes,
Nous admirons de tels exploits !
Est-ce donc le malheur des hommes
Qui fait la vertu des grands rois ?
Leur gloire féconde en ruines,
Sans le meurtre & sans les rapines

Ne sauroit elle subsister ?
 Images des Dieux sur la terre,
 Est-ce par des coups de tonnerre
 Que leur grandeur doit éclater ?
 Montrez-nous, guerriers magnanimes,
 Votre vertu dans tout son jour,
 Voyons comment vos cœurs sublimes
 Du fort soutiendront le retour.
 Tant que sa faveur vous seconde,
 Vous êtes maîtres du monde,
 Votre gloire nous éblouit.
 Mais au moindre revers funeste
 Le masque tombe : l'homme reste ;
 Et le héros s'évanouit.

Rousseau, Ode à la Fortune.

Weak is our judgment when we own,
 That horrid wars our wonder move ;
 Can human misery alone
 A mighty monarch's virtue prove ?
 Must teeming ruin, wasting wide,
 Murder and rapine by her side,
 Their glory ever frame ?
 God's images on earth allow'd,
 Must the dread thunder, roaring loud,
 Their boundless power proclaim ?

Illustrious warriors, shew mankind,
 In every state your virtue clear ;
 Shew them when fortune proves unkind,
 How free your lofty minds you bear.
 While you with smiles she deigns to bless,
 The world's great masters all confess,
 Your glory blinds our eyes :
 But if to smile she once disdains,
 The mask falls off, the man remains,
 Away the hero flies !

Le soleil plus puissant, du haut de sa carrière
 Dans son cours éternel dispense sa lumière
 Il dissout les glaçons des rigoureux hivers :

Son

Son influence pure
Ranime la nature
Et maintient l'univers.

Ce feu si lumineux dans son sein prend sa source,
Il en est le principe, il en est la ressource ;
Quand la vermeille Aurore eclaire l'orient
Les astres qui pâlisent
Bientot s'ensevelissent
Au sein du firmament.

Phil. de Sans-Souci. Ode aux Prussiens.

The sun, most powerful, in his lofty course
For ever rolls, while radiant streams he pours,
Rough winter's fierce attack he quick restrains ;
His strength restores
Nature's faint powers,
The universe maintains.

The fire all-glorious in his bosom glows,
From him it springs, from him it ever flows ;
When morning's blushes gild the orient coast,
With pallid fires,
Each star retires,
And in her beams is lost.

XXIII. *Stanzas* are strophes, consisting either of four or six, eight or ten, or of five, seven, eleven, or thirteen verses. They are so called from the Italian word *stanza*, which signifies a dwelling or resting place ; because at the end of each stanza the sense is complete. There are many examples of these to be found in the treatise on versification by Richelet, of which we shall here give the following only :

La mort a des rigueurs à nulle autre pareilles :
On a beau la prier ;
La cruelle qu'elle est, se bouche les oreilles,
Et vous laisse crier.

Le pauvre en sa cabane, où le chaume le couvre,
 Est sujet à ses lois ;
 Et la garde qui veille aux barrières du Louvre,
 N'en défend point nos Rois.

MALHERBE.

With the rigour of death there is nought can compare ;
 We are free to implore ;
 But his ears are obdurately deaf to each pray'r,
 How loudly soever we roar

The peasant, whose cottage is cover'd with thatch,
 Must submit to his laws ;
 Nor can the fierce soldier, who guards at the gate,
 Save the king from his claws.

XXIV. *Quadrans* are commonly composed of long verses. They should all have, if possible, the same measure, and each of them a distinct and complete sense. The rhymes in the quadrans answer each other after two manners ; in the one, the first line rhymes to the fourth, and the second to the third ; in the other the first line rhymes to the third, and the second to the fourth.

XXV. We have already given a description of the Madrigal in the thirty-ninth section of the preceding chapter. M. Despreaux says :

Le madrigal plus simple & plus noble en son tour
 Respire la douceur, la tendresse & l'amour.

The madrigal does purer, nobler passions move,
 And breathes of sweetness, tenderness and love.

But sometimes it breathes other sentiments also, as appears from those that were made in praise of Lewis XIV.

XXVI. An ingenious simplicity forms the characteristic of a *Rondeau* : it commonly consists of thirteen verses of ten syllables. In French the rhymes are eight masculine and five feminine, or seven masculine and six feminine. There must be two pauses,

pauses, one after the fifth verse, and the other after the repeated words or first burden of the poem.

XXVII. The *Triolet* is likewise composed of stanzas or strophes. It takes its name from the triple repetition of the first verse in each stanza.

Pindare étoit homme d'esprit,
En faut-il d'autres témoignages ?
Profond dans tout ce qu'il écrit,
Pindare étoit homme d'esprit ;
A qui jamais rien n'y comprit
Il scut bien vendre ses ouvrages :
Pindare étoit homme d'esprit,
En faut-il d'autres témoignages ?

Pindar was a man of wit,
What other instance need I tell ?
Profound he was in all he writ,
Pindar was a man of wit :
And surely nothing equals it,
He knew right well his works to sell,
Pindar was a man of wit,
What other instance need I tell ?

Beze qui produit ce bon vin
Doit passer pour très bon catholique ;
J'estime mieux que Chambertin
Beze qui produit ce bon vin ;
Si le disciple de Calvin,
Beze, passe pour hérétique,
Beze qui produit ce bon vin,
Doit passer pour très-catholique.

Beza who produc'd this wine
Ought to pass for catholic.
I love more than Chambertine
Beza who produc'd this wine.
If that disciple of Calvin,
Beza, pass for heretic,
Beza who produc'd this wine
Ought to pass for catholic.

XXVIII. There are no fixed rules for the mechanical composition or structure of the *Vaudeville*. Every kind of verse may here be used, as they may be sung to every sort of tune. There are immense collections of these. The following is the first stanza of a *Vaudeville*, remarkable for difficult rhymes.

Je suis charmé de la petite Iséc,
Et j'aime mieux son joli bec
Que le plus doux forbec :
J'irois pour elle à la Mecque ;
Elle eût rendu fou Sénèque
D'un salamalec.
J'aime mieux près d'elle hareng pec,
Ou bien du pain tout sec,
Que perdrix & vin Grec.
O mort, si tu la fais échec,
Viens m'emporter avec, &c.

I'm charm'd with little Isabel,
More sweet her kifs than roses smell,
With her at Moco would I dwell,
For Seneca of nought can tell
That will like her all ills expel.
With her the waters of a well
The richest wines of France excel ;
Or muscle roasted in a shell
The sumptuous feast of sam'd turtle.
Oh death ! if e'er thy gripe so fell
Shou'd hurry her away peilmell
No pow'r on earth my grief shall quell.

We shall here add a stanza of a song which appears to us as ingenious as pleasing : it is in praise of a herb they call fern.

Vous n'avez point, verte Fongere,
L'éclat des fleurs qui parent le printemps ;
Mais leur beauté ne dure guere,
Vous êtes aimable en tout temps.

Vour

Vour prêtez des secours charmans
Aux plaisirs les plus doux qu'on goûte sur la terre :
Vous servez de lit aux Amans
Aux Buveurs vous servez de verre.

'Tis true you have not, lovely Fern,
Of spring's gay flowers the gaudy pride,
But their beauties soon decay
While yours are ever fresh and gay.
Delightful aids you still provide
To joys that charm the human soul
A couch, where lovers minutes sweetly glide,
And for the sparkling wine a pleasing bowl.

With regard to the *Virelay*, we have explained its construction in the thirty-ninth section of the preceding chapter: examples of it are to be found in the old poets, as also in the poems of abbé Regnier Desmarais.

XXIX. There are very few examples of the *Chant Royal* to be met with in modern poets; and as they are all composed of five stanzas they would take up too much room here. In the works of Clement Marot, published at the Hague in twelves, vol. i. page 243, there may be seen a *Chant Royal* on the Conception.

XXX. The examples of the *Mascarade* are still more rarely found among the French writers; but in return there are great numbers of them among the Italian; as in Laurence of Medicis, Strozzi, Volterre, Cambi, Villani, &c. There are some also in German; as those of Koenig, and others. It is easy to imagine, that all kinds of verses are admissible into these sorts of impromptu or extemporary productions, as they are called, though sometimes deliberately composed. We have already described, in the preceding chapter, the nature of the *amphigouris* and *concordant*.

XXXI. It is not easy to conceive for what reason the French poets make their elegies of so great a length; and still less why they do not follow the example

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ample of the ancient poets, by composing them of verses of different measures. The long Alexandrines, with dull and continued rhymes, change the nature of elegies, by turning them into mere doleful epistles.

As these are all of an immense length, they cannot be inserted here. That of the great Corneille, which begins with the following line, may serve as a good example.

Lorsque sous le plus juste & le plus grand des princes, &c.

XXXII. Among the modern French poets, Madame Deshoulières, Mess. De Fontenelle, and De la Motte, are the principal who have attached themselves to the composing of eclogues and other pastorals, and in which they have succeeded best. But as these pieces are all too long for us to insert, we are obliged to refer the reader to their works themselves, which are in the hands of every one. We shall only remark, that the eclogue admits of all sorts of rhymes, as well continued as alternate and irregular; and also of all kinds of measure: and that a dialogue between shepherds may likewise be very happily introduced, by placing the scene in a wood, or on the bank of a river.

XXXIII. With regard to the cantata, neither the past nor the present age have produced any thing of an equal perfection with those of the celebrated Rousseau. The seventh cantata, intitled *Circê*, which begins with the following words, is one of the most remarkable.

Sur un rocher désert, l'effroi, &c.

It is to be remarked, that in the cantata the poet should constantly endeavour to assist the composer, by supplying him with such words as are susceptible of a pathetic and beautiful expression in music. By the idea which the cantata gives us, we may easily conceive the nature of the cantilla and serenade, as they are of the same species.

XXXIV.

XXXIV. The translation we have of the psalms by Clement Marot, is antiquated, weak, mean and slovenly: it entirely disguises the sublimity of the original text, to which nothing can be compared. M. Rousseau has translated, or rather paraphrased and imitated, some of the psalms, with wonderful success, in his sacred odes.

Hymns and motets are commonly composed in Latin; and with regard to the noels, or Christmas songs, they are of so low a class, that we decline giving any example of them.

XXXV. The didactic or dogmatic species, as well as that of tales and fables, are constantly too long to be inserted in a work like this. They must therefore be sought in the works of the poets themselves: the French Parnassus swarms with them. With regard to the other inferior kinds of poetry, we think we have clearly described them in the preceding chapter; and to which we shall not hesitate to refer the reader, as we are persuaded it contains instruction sufficient to guide him in the study of the versification of such poems as are there included; and which form so many species of the several capital divisions of poetic composition *. “But has majestic reason
“ vouchsafed propitiously to hear our invocation?
“ Have we been directed by her influence in tracing
“ the design of the most charming of all arts, *The*
“ *Art of Fiction*? Favourites of Apollo! emulators
“ of Voltaire! if the god shall invite you to gather
“ his laurels, if he shall point out to you the sublime
“ career, and shall even seat you in his chariot, and
“ give you the command of his coursers—consult the
“ veterans in the art for the manner of conducting
“ them. Those illustrious followers of the conqueror
“ of Python! It is from them you must learn the
“ means of avoiding the direful lot of Phaeton.”

C H A P.

* Our author has given, however, specimens of several other kinds of versification, but as they are chiefly such as are peculiar to French poetry, and consequently would afford but little entertainment to an English reader, it appeared most eligible to omit them.

C H A P. VIII.

M U S I C.

MUSIC being the third method of expressing our thoughts by the organ of the voice ; and being, like eloquence and poetry, calculated to excite, by the sense of hearing, lively or tender sensations in the mind of the auditor, and thereby to rouse his sentiments and passions ; we are here to make the analysis of this ingenious and sublime art. It would be employing our time to very little purpose, were we here to make any learned researches, or rather conjectures, concerning the origin of music, and whether it were not from the warbling of the birds that men first learned this art. We have already said, that every being presently discovers those faculties with which nature has endowed it. The least elevation or depression of the voice must have, necessarily, made the first race of men perceive that their organs were capable of producing other sounds than those of speech ; and that singing was as natural to them as speaking. A little more experience must have shown them that metals, and all other bodies, when struck and disposed in a certain manner, produced also sounds. Lastly ; it must have required some considerable time to discover that the guts, when dried and properly prepared, were also sonorous. The different musical instruments have, therefore, been successively invented. And who knows how many others may hereafter be produced ? The tones that are drawn from china, glass, wood, and even straw, were almost unknown till our days.

II. We shall not inquire, moreover, into the physical cause of the sounds of bodies ; nor what is the metaphysical reason of the sensation of harmony. We shall even avoid, as far as possible, the considering of music as it relates to the mathematics, or engaging in calculations concerning the different combinations of sounds.

sounds. It is our intention to consider the practical part of this art only; and we shall, therefore, endeavour briefly to point out the principles on which this practice is founded: and to show in what manner genius is here concerned; what it is that forms the talent of a musician; and what is that beauty of expression which has caused music to be ranged among the polite arts.

III. But before we proceed to the analysis of this art, such as it now is, it will be necessary to say a few words on the music of the ancients, and of its several kinds, in order to facilitate the understanding of what is to follow. Now, the ancients divided their music into six genders: 1. the *rhythmic*; which regulated the movements of the dance: 2. the *metric*, that governed the cadence in declamation, and of which we have already given examples in the preceding chapter: 3. the *poetic*, which prescribed the number and dimension of feet in verse: 4. the *organic*, that regulated the performance of instruments: 5. the *hypocritic*, which gave rules for the gestures of pantomimes: and, 6. the *harmonic*, by which singing was regulated. We find these names, and different distinctions, in the writings and monuments of the ancients; but we are very far from knowing what was their true essence. Ancient music appears to be lost to us; and maugre all the efforts of the learned, there is but little probability that we shall ever be able to transpose any one of their modes to any mode that is known to us. We do not even know all their instruments; and still less the effects they produced.

IV. Other genders of music have succeeded to those of the ancients. We know nothing more of the metric, poetic, rhythmic, and hypocritic, than their names: though we still apply music to verse, to poetry, to the dance and pantomimes. It is now divided into *vocal* and *instrumental*; *diatonic*, *chromatic*, and *enharmonic*. Vocal music regulates singing, and the instrumental all kinds of musical instruments whatever. The diatonic gender proceeds by different tones, either in ascending or descending; and contains

contains only the two tones, major and minor, and the semitone major. There is in this gender a tone between all the notes, except *mi* and *fa* (or *e* and *f*, according to the Italians); and between *fi* and *ut* (or *b* and *c*) where there is only a semitone major. This natural and regular order of sounds probably formed the most ancient gender of music. The second, or chromatic gender; so called because the Greeks marked it with coloured characters; or, as others think, the word signifying coloured and variegated, it was so called, because it varies and embellishes with its semitones, with which it abounds, the simple diatonic gender; and makes, so to say, a coloured picture of a print. The flat *B* belongs to this gender, and was, they say, invented in the time of Alexander the Great, by Timotheus the Milesian. The third, or enharmonic gender, is full of dieses, which are the least sensible divisions of a tone: so that the enharmonic diesis, which is marked on the tablature or scale, with the figure of St. Andrew's cross, is the difference between a semitone major and minor. All these three genders are equally applicable both to instrumental and vocal music.

V. They likewise now distinguish in Europe the different national musics; as the Italian, French, German, English, Polish, &c. and this distinction arises from a sort of musical style, from the particular use that is made of the modes, the time and measure, and other objects, which give them peculiar characters. This difference, whether it be real or imaginary, has given rise to warm contestations at Paris, concerning the merit of the Italian and French music: a dispute in which men of the greatest abilities have engaged. Without pretending to decide their differences, we shall observe, that most of the civilized nations of Europe, as the English, German, &c. have adopted the Italian music; and that it is admired even in France. The French music, notwithstanding, has also infinite charms; and those foreign connoisseurs, who are at first prejudiced against it, are all, at length, delighted with the French operas.

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Their music appears, moreover, to be made for their language; and nothing is more ridiculous than a French song sung to an Italian tune. The partisans of Italian music reproach the French with the uniformity of their airs. But does this uniformity arise from the nature of French music itself? Does its character, its natural properties, prevent it from being diversified? This is merely the effect of the sterility of the composer, whose imagination does not present him with a sufficient number of new turns and melodies. The same thing must happen to an Italian composer of little genius. Do not even all their recitatives partake of this uniformity? And how many Italian airs do we see which are formed after the same model? The French recitative, though melodious, is it not more diversified than the Italian? And are not their airs, their choruses, &c. susceptible of the same variety?

VI. Modern music in general has two objects, which should be well distinguished; and which are *melody* and *harmony*. The melody, or tune, is nothing more than a succession of sounds, marked by notes, which succeed each other. Harmony, on the contrary, is a succession of concords. By concords are meant several sounds which are produced at the same time, and marked in the score or tablature by notes placed the one over the other. The difference between a higher and lower tone is called an *interval*, as well in melody as harmony. There are in music seven original or fundamental tones, which ascend or descend by regular intervals. The French mark these tones by *ut, re, mi, fa, sol, la, si*; and the Italians by *c, d, e, f, g, a, b*: and by adding *ut* or *c*, which begin the following octave, these eight tones, with their intervals, form a *scale* or *octave*. In proportion as these tones ascend or descend, above or below the limits of this scale, they begin a new octave: and in each octave the tones which are of the same denomination are always in *unison*, or of the same sound.

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The intervals between these seven tones of the scale are equal among themselves, or very nearly so: and they show how much one tone is more acute, or more grave than another; but not how much stronger or weaker: for whatever strength or softness may be given to any tone whatever, it constantly remains equally high or low. We must further remark with regard to the scale, that the intervals between

ut: re, re: mi, fa: sol, sol: la, and la: si, or c:
d, d: e, e: f, f: g, g: a and a: b,

are equal: and the intervals between

mi: fa, and si: ut, or

e: f, and c: b,

are also equal among themselves; but this difference is but half that of the other tones. For which reason the intervals between *mi: fa* and *si: ut*, or *e: f* and *b: c*, become semitones; and the intervals between the others are whole tones. They otherwise call a whole tone a major-second, and a semitone a minor-second. To proceed therefore from one tone to another in a diatonic order, either in ascending or descending, signifies to proceed by tones or semitones, or by major or minor-seconds.

VII. The different intervals of the scale of tones are called as follow:

1. The interval, formed by a tone and a semitone, is called a *third lesser*, or *tierce minor*.

2. The interval, formed by two whole tones, is called a *third greater*, or *tierce major*.

3. The interval, formed by two whole tones and a semitone, is called a *fourth*.

4. The interval of three whole tones is called a *tritone*, or *superfluous fourth*.

5. The interval of three whole tones and a semitone is called a *fifth*.

6. The interval of three whole tones and two semitones makes a *sixth lesser*.

7. The interval of four whole tones and a semitone is called a *sixth greater*.

8. The interval of four whole tones and two semitones forms a *seventh lesser*.

9. The

9. The interval of five whole tones and a semitone is called a *seventh greater*.

10. The interval of five whole tones and two semitones makes an *octave*.

11. A semitone, or a tone above the octave, produces a *nona*, or ninth lesser or greater.

They sometimes go still further. But it plainly appears, that the ninth is nothing more than the octave of the second; the eleventh the octave of the fourth; the twelfth the octave of the fifth, &c. The octave of the octave is called the *double octave*, *triple octave*, &c. It is also called the *decima quinta*: and for the same reason, the double octave of the third is called *decima septima*; and the double octave of the fifth, *decima nona*; and so of the rest.

VIII. The sign, by which they raise a tone by a semi tone, is called a *cross*. (See fig. 5).

The sign, by which they lower a tone by a semitone, is called a *be*, and is marked thus *b*.

The sign, by which a tone so raised, or lowered, is restored to its natural place, is called the *sign of re-establishment*. (See letter *m* fig. 9).

The other signs, by which notes are shewn to be sometimes united, sometimes sharpened, softened, or strengthened, &c. differ among most nations, and even among many able composers, who sometimes adopt different signs.

IX. An accord composed of tones, whose union pleases the ear, is called a consonant accord; and the tones, of which it is composed, are called, with regard to each other, *concorde*s. The *octave* of a tone is the most perfect concord; the next is the *fifth*; the next the *third*; and so of the rest. An accord, composed of tones, whose union is disagreeable to the ear, is called a dissonant accord, and the tones, of which it is formed, are called *discords*; and such are the second, the tritone, and the seventh. But even these discords may be rendered pleasing to the ear, and be made the ornaments of music, by their preparation and resolution.

X. There

X. There are in the French alphabet five vowels and nineteen consonants; and from the different transpositions and combinations of these, arises that immense variety of words and phrases by which language is formed, and which might be still infinitely increased, were there objects to which those words could be applied. In like manner the transpositions and combinations of the seven primordial tones, and the five semitones, with their dieses or various divisions through all the octaves of which they are susceptible, produce that immense number, that infinite variety of melodies, airs, tunes, and harmonies, which compose the music of all nations: an effect almost miraculous, and in which the imagination is lost. In language the syllables long or short, accented or unaccented, still augment this variety: and in music, the different measures, or times, that are employed in performing each tone or note, form likewise an infinite variety in the expression. There are certain signs or characters agreed on by common consent, by which music, like language, is expressed to the eye; by which each tone is distinguished, as well as the octave in which it is to be placed, and the time it is to continue. It is this manner of writing music, which is called a *tablature* or *scale*, and which it is proper here briefly to explain.

XI. They begin the musical scale or system, by drawing five lines, between which are four spaces. (See fig. 2). Sometimes they also draw lines above or below the scale, if the melody be extended higher or lower (See fig. 3.).

These lines (but never the spaces) are marked with a general key, which denotes the line on which is wrote the tone or note *c* or *ut*, or the tone of *f* or *fa*, or else the tone *g* or *sol*, and which by that means serves to find the tone of each note by its place in the scale. (See, in fig. 4, the keys and the manner on which they are placed).

Ut or *c* on the first line (*a*) denotes the common treble.

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The same mark on the second line (*b*) denotes the counter tenor (alto).

The same on the third line (*c*) for the counter tenor or common alto.

The same on the fourth line (*d*) for the tenor.

Fa, or *f*, on the third line (*e*) the upper base.

The same on the fourth line (*f*) the common base.

The same on the fifth line (*g*) the lower base.

Sol, or *g*, on the second line (*b*) the common treble, or the violin or other instrument.

The same on the first line (*i*) the upper treble, or the first violin.

The first fundamental tone being thus given, it is easy to find all the other notes, either in ascending or descending.

XII. Each melody or tune, whatever, is either in a *flat* or *sharp* key, or, as the Italians express it, *bard* or *soft*; and this difference is marked by those signs being placed before it. (See fig. 5.) It is founded on the tierce or third of the fundamental note, which constitutes the tone major when it is major, and minor when it is minor, &c.

XIII. A note is a sign or mark, which by its situation expresses a tone, and by its different figure the length of time which that tone or sound is to continue. These notes are of nine different kinds, as is shewn in fig. 6. with their pauses or rests and their value.

The round (*a*) or semibreve is equal to one pause (*b*) or one measure of time.

The minim (*c*) is equal to half a pause (*d*) or half a measure.

The crotchet (*e*) equal to half a minim (*f*) or one fourth of a measure.

The quaver (*g*) equal to half a crotchet (*h*) or one eighth of a measure.

The semiquaver (*i*) equal to half a quaver (*k*) or one sixteenth of a measure.

The demi-semiquaver (*l*) equal to half a semiquaver (*m*), or one thirty-second part of a measure.

The pauses or rests, that denote more than one measure, are expressed by different signs (see fig. 7.), where to each sign is added the number of measures to which it is equal.

XIV. There are also certain lines, either straight or curved, which shew that the different tones, marked by the notes, are to be performed together, or at the same time, by means of an instrument that is susceptible of it; or that we are to employ all the notes, that are included by those lines, in singing one syllable of the text that is under them; or that the instrument should connect them together without any intermission. (See fig. 8.)

A point (.) behind a note, expresses, with regard to the time, the half of the note that precedes it.

XV. There are also some other signs which we must not here omit to explain. (See fig. 9.)

The sign *a* denotes a slow measure, and *b* one that is quick and lively.

c and *d* imply an entire repetition of what goes before.

e and *f* shew that those notes only are to be repeated which are between that parenthesis.

g, *h*, *i*, signify that so much must be repeated, as follows the note, over which that mark is placed.

k is the sign of precaution (*signum custodis*) and shews the note that begins the following line.

l, &c. are signs of repose, or conclusion.

XVI. What is called in music *measure* (*tactus*) is the method of determining the time that is to be assigned to each note in a regular movement. This duration, or measure of time, is marked by regularly lifting up or putting down the hand or foot, in order to give an equal movement to the voice or instruments, by one token common to them all. This measure is marked at the beginning of each piece, as is expressed in fig. 10. The movements of each of these measures are only to be learned by the study and practice of music itself.

The Italians likewise express these times, these measures, and their movements, by the words *lente*, *adagio*, *andante*, *vivace*, *ficiliana*, *grave*, *allegro*, *presto*, *prestissimo*, &c. The French characterize them more particularly by combining the musical expression with that of the dance, and by borrowing the names of that art, as *louver*, *saraband*, *minuet*, *gavot*, *gig*, *bourée*, *rigadoon*, *muset*, *courant*, *cha-on*, *passépie*, &c.

XVII. All this music, which is simple and natural, is likewise susceptible of many accessory ornaments, which arise from a *just accent*, from a *true tone*, from a *trillo* that is brilliant and diversified, from a *voice* that is strong, full, and well sustained, without being stretched to an excess, from an ingenious and harmonious *cadence* at the end of an air, and from many other beauties which the masters of the art know how to give to a voice or an instrument, and which must be learned from them in the study of the art itself.

XVIII. From the complete concord arise the four principal parts, which are the treble (canto), the counter-tenor (alto), the tenor (tenore), and the base (basso). Complete music should, therefore, have these four parts, for which the author should compose the melodies according to the rules of harmony, in his score or partition (partitura). There are likewise quattros, trios, duos, solos, and sonatas, symphonies, and concertos for all the instruments, where each of them may be exerted in performing the principal part, the cantatas, the airs for the voice, the overtures in an opera, the marches, and numberless other pieces of music, whose accompaniment is different and arbitrary.

XIX. The musical art may likewise be considered from two different points of view, that is, with regard to *composition* and *execution*. It will not be expected that we should here enter into the detail of the rules of composition, on which the greatest masters have wrote large treatises, without having nearly exhausted the subject. The limits of this work will

only permit us to make some cursory remarks, drawn from nature, and from the first principles of this art, on their labours in general.

XX. Music is made use of in churches or religious ceremonies; or in operas, either serious or comic; or with the dance, or in concerts; for private amusement, or in the army. Now these different uses necessarily require *different styles*. The style of religious or spiritual music should be grave, majestic, and divine, as far as it is possible for weak mortals to express a celestial strain. And in this expression there should never appear a servile imitation of nature. The composer should raise himself above all earthly ideas, or at least to the highest degree of sublimity to which they are capable of ascending. There is a certain piece of church music, composed by a very able master, which begins with these words, taken from the xxvth chapter of St. Matthew: *And at midnight there was a great cry: behold the bridegroom cometh; go ye out to meet him.* The composer, seduced by a false idea of imitation, began by touching twelve times, without any accompaniment, the last string of his great bass viol, in order to express the word *midnight*. Then followed a slow movement, which announced the arrival of the bridegroom, and served as a symphony to the chorus. The chorus then sung in a low note the words of the text, till they came to the words *great cry*, when all the singers in fact cried aloud, with all their force, *behold the bridegroom cometh*. This imitation was ingenious, but improperly adapted. Musicians should carefully avoid copying after these errors. We have at the same time motettos, spiritual music, adapted to portions of scripture, as well in Italian and French as Latin, which are chefs-d'œuvres of their kind, and deserve to be regarded as models. Those sorts of compositions, which are called *counterpoint*, and *falso bordone*, are very applicable to this kind of music.

XXI. When a composer is forming the music of an opera, he should well remember, that his business is much more to excite the sentiments, and move the passions.

passions, by a noble and happy expression of the words of the text, than to display a dazzling brilliancy in the music. There are in an opera, 1. a symphony, or overture, purely instrumental; 2. airs for the duos, trios, &c. 3. the choruses; 4. the common recitative, and those which the Italians call *accompagnamenti*; and, 5. the airs for the dance. The symphonies should be equally brilliant in their melody, and majestic in their harmony: they form the introduction of the performance, and should strike and announce something great. It was for this reason that the symphonies were formerly called overtures. They constantly began with a solemn adagio or lente, which was followed by a fugue in allegro, and finished with a minuet, or other agreeable air. I must confess, that, considering their destination, I prefer them to the modern symphonies. An able composer, however, is not to be confined. Of all the parts of an opera, the *airs* are the most essential: it is here that every one talks of the expression and imitation of nature; and it is here that every nation flatters itself with excelling. May I be allowed to speak my sentiments here without risk of giving offence? In the Italian airs I frequently find the words so trifling and insipid, that the composer, who expresses them the best, expresses in fact but very little. They consist either of common-place gallantries, or of the trite similes of a gentle shepherd, or a tender turtle, or the pilot who ploughs the liquid element, or a furious storm, or other like wretched conceit, which can never make any impression on the discerning part of mankind, and consequently are not worth the trouble of expressing. The poet should here lend his aid to the composer. In the airs of a French opera, on the contrary, the words are highly pleasing; but the composers of that nation do not much labour to express the real sentiments they contain. They mistake the matter, and torture themselves with endeavouring to express the words and phrases. When they chance to meet with the thunder that roars, a bird that flies, or a river that flows, they are in raptures, they trill

incessantly, the senseless admirers are in ecstasies, the *petits maitres* shout with applause, and the man of sense shrugs his shoulders. All the little imitations of a heart that beats, a bird that sings, a murmuring stream, &c. are puerile and affected, and discover great *sterility* of invention in the composer, and ought at least to be used with great moderation. Each air has usually two parts. The common method of playing the first part over again, which they call the *da capo*, and the endless repetitions of phrases and principal passages, are highly disgusting to such as look for what is natural and striking in a performance. Were I a woman, and should my lover repeat to me thirty times together in a breath, with different tones and modulations, *I adore you, I adore you, I adore you*, he would make me very sick of his adoration, and I certainly should not adore him in turn.

XXII. The *choruses* are the triumphs of harmony, and perhaps the most beautiful and most difficult part of an opera. Every thing should be here risked. If the composer succeeds, he has performed his *chef-d'œuvre*: they ought not, however, to be all cast in the same mould. The characters of those who compose the chorus, and the words of the text, will furnish him with sufficient variety. The *recitative* is nothing more than a noted declamation, founded on the dialect of each language, and the natural inflexions of the voice of each people. Nothing can, therefore, be more absurd, than to apply the acute and lively recitative of the Italians to the grave and solemn language of the Germans. The monotony of the Italian recitative is also sufficiently disgusting, and the harmony is scarce ever discernible, because, in the accompaniment, the concord of the instruments is never heard with the voice, but either precedes or follows it. Those parts, which the Italians call *accompagnamenti*, do in part supply this defect; and there are some of them that are charming. The French, however, appear to me to have well adapted their recitative to their language, and have found the pleasing
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secret of displaying, at the same time, both melody and harmony. Nothing can be more charming, for example, than that part which they call the dispersing of the chaos, in the Ballet of the Elements, which begins with these words, *The time is arrived*, &c. With regard to the music for the dance, it is certain, that the French there excel, and that their melodies agree admirably well with all the different characters of the dance, which should be constantly well observed in these sorts of compositions. I cannot here avoid mentioning two articles that have always disgusted me in the French opera. The one is a superfluous instrument that is not to be found in any other opera, and, at the same time, a very vile instrument, and one that destroys the truth of the whole performance: this is a kind of leather bludgeon, with which the master of the chapel, or the director, beats time incessantly. The other article is, that notwithstanding this noisy guide, the singers do not constantly agree with the instruments; and the reason is, that the finest voices, especially among the female singers, are not always good musicians; from whence it comes, that the truth of the art is frequently sacrificed to the beauty of a voice. The excessive straining of the throat, moreover, frequently produces a screaming that is hideous to a musical ear.

XXIII. The music of concerts is either vocal or instrumental. There is one essential remark that we must here make with regard to the former: which is, that the business of a concert is not so much to interest and affect, as to display the beauties of the music, and to shew how far the art may be extended. I can, therefore, pass over, in the airs or cantatas of a concert, many little imitations, which in a preceding paragraph I have condemned in the opera. The poet should here also furnish the composer and performer with the means of exerting all the springs of their art, of exhibiting all the magic of the musical powers. I must confess, that I know of nothing so proper for this purpose, nor any thing so perfect

fect in their kind, as are the cantatas of the late M. Rousseau.

XXIV. With regard to instrumental music, it is more difficult than is commonly imagined to excite, without words, the emotions of the mind, the sentiments and passions. It is the pantomime part of music. The composer, however, should constantly endeavour to express something, and not produce mere empty sounds, that strike the ear, but make not the least impression on the heart. We will here make a few observations on this matter, as its importance requires it. When there is nothing in music but mere harmony, it wants its most essential quality; it becomes a mechanical art, it dazzles but cannot affect the mind. This is a reflection that the greatest part of modern composers never make. Charmed with the trick they have of marrying sounds that seem not to have been made for each other, they seek for nothing more. The design of the polite arts is however, as we have frequently said, to excite pleasing sensations in the mind; and of doing this, music is greatly capable. The tones are alone sufficient to affect the heart with the sensations of joy, tenderness, love, grief, rage, and despair. In order to do this, it is necessary to invent some theme or simple melody, that is proper to express each passion or sentiment; to sustain that kind of language throughout the whole piece; to prepare the hearers by degrees for the principal action; and lastly, to labour to give that principal action all the art and all the force of which it is susceptible. All this is to be understood of the moral sensations, where it is scarce possible to imitate nature too closely, whereas a too minute imitation of material objects becomes cold and insipid. It is easy, for example, to comprehend a composer's meaning, when he begins a piece of instrumental music with a quick unison, which is followed by a tumultuous passage, performed principally by the base, and which, in the midst of the greatest tumult, is sometimes suddenly interrupted by a general pause; and the whole
piece

piece perhaps ends abruptly, when it was least expected. It is easy to perceive, that he here means to express the passion of rage. The pleasing sentiments are still more easily expressed, more readily conveyed to the human heart. They who attend to the effects of a concert, and are capable of discerning, may easily discover, from the looks of the sensible part of the audience, the effects of the interior sensations. All this is meant of instrumental music alone: when the composer has words to express, it is still more easy to produce the proper tones. Examples are frequently more instructive than precepts. We shall propose those of one master only. All the sonatas and other pieces of Corelli are chef-d'œuvres and models: every composer, who shall carefully study them, will find them of infinite utility, and by them form his taste. It is not in the performing of dazzling difficulties that the beautiful consists; though such is the false judgment of the present age. Sooner or later nature will prevail: it is that which the composer should at all times consult, whether it be a concert, sonata, trio, or any piece whatever that he composes for an instrument. Each instrument, moreover, has its bounds, its excellencies and defects, which are likewise to be consulted. A flute, for example, is a rural instrument, that is not capable of rendering passages, the arpeggio, in the manner of a violin, and it is striving against nature to attempt it. As each instrument, therefore, has its peculiar beauties, the composer should know them, and endeavour to afford opportunities in which they may be displayed.

XXV. Perhaps it will not be found disagreeable, if we here give a short list of the principal musical instruments made use of in Europe, in the middle of the 18th century. Such are,

First, Those instruments which are played by striking their strings, as, 1. the harpsicord; 2. the spinet; 3. the pianoforte, an admirable instrument, invented at Freyberg in Saxony, by Silberman, the strings of which are of steel, and the stops, instead of

jacks, are armed with little hammers, which make the strings sound either high or low at pleasure; 4. the pantaloon; 5. the cymbal; 6. the dulcimer.

Second, Those instruments which are played on by pinching their strings, as, 1. David's harp; 2. the harp pointed at top; 3. the guitar; 4. the small guitar, called a *cythera*; 5. the theorbos; 6. the lute; 7. the chalcedon.

Third, Those instruments that are sounded by touching their strings with a bow: 1. the violin, the first and most indispensable of all instruments; 2. the viola di braccio, or tenor; 3. the violoncello; 4. the great German base; 5. the counter violin; 6. the viol d'amour; 7. the viola de gamba; 8. the sea-trumpet, a monochord instrument.

Fourth, Wind instruments that are played by striking their stops: the church organ; 2. the chamber organ; 3. the portable organ, which is played by turning a winch.

Fifth, Wind instruments, whose different tones are formed by the fingers: 1. the German flute; 2. the common flute; 3. the lip flute; 4. the flute d'amour; 5. the hautboy; 6. the reed; 7. the flagelet; 8. the bagpipe; 9. the cornemuse; 10. the clarinet; 11. the bassoon; 12. the counter bassoon; 13. the serpent.

Sixth, Those wind instruments whose different tones are formed by the tongue: 1. the trumpet; 2. the horn; 3. the hunting horn; 4. the clarion.

Seventh, Instruments played by striking them with something held in the hand: 1. chimes, whether they be of iron, glass, china, wood, straw, or any other matter; 2. the triangle; 3. the kettle drum; 4. the common drum; 5. the timbrel.

Eighth, The music of the Janizaries, accompanied by the sound of brass basons. These make in all 46 different kinds of instruments.

XXVI. It is not necessary to remark, that the success, the charms of an instrumental concert, depends upon the ability of the performers; but every one does not sufficiently consider how much a just proportion

portion in the use of the various instruments, and their arrangement also, contribute to produce that degree of perfection which is very sensible to every connoisseur. This proportion consists in the number of performers that are employed in every part, or *discanto*. The first violins, hautboys, flutes, &c. perform the treble; the second violins, flutes, hautboys, &c. execute the counter tenor; the viola di braccio the tenor; and the bass viols, or violoncellos, bassoons, theorbos, &c. the base. The harpsicord runs through the whole, and renders by its accords all the four parts at once. When it is intended that any particular instrument should excel by performing the principal part (*obligato*), it takes the place of the voice, and all the other instruments should not only accompany it with respect and discretion, by exactly observing the *piano* or *forte* that is marked, but should also make pauses in those passages where the composer has intended that the voice or principal instrument should be heard alone (*solo*). A concert, moreover, should not be crowded with noisy instruments, as kettle drums, trumpets, French horns, &c. Lastly, the different instruments should be so judiciously disposed, that their several sounds may be clearly distinguished, and not confound and destroy each other. The disposition of the place will in some degree regulate this arrangement, and the taste of the director must do the rest: for it is impossible to prescribe any particular rules for this matter; though the cautions we have here given may not be found altogether useless.

XXVII. What can we say of the *execution* of music? With regard to the vocal part, the voice forms the principal merit, and a voice is the gift of nature. This natural talent may, however, be greatly improved by practice, without the necessity of renouncing an essential quality of our species, preserving only the exterior figure of a man, and reducing ourselves to the state of a plaintive, musical shadow. Even most of the natural imperfections of a voice may be reformed by what is called *method* and *taste*.
It

It is by riding that a man becomes a jockey, and by singing an excellent singer.

XXVIII. The same may be said of instrumental music. It is by the frequent repetition of similar actions that men become expert and perfect in all matters. It is true, that many instruments require a certain agility in the fingers, others demand a natural disposition of the breast, the tongue, or the lips: practice, however, will greatly assist. He that would excel in this art, must apply himself sedulously to it; should learn from a good master the sound principles; should attentively listen to able performers and celebrated virtuosi, in order to form a just method. He must, moreover, think, reflect, apply his mind to the business, and not content himself with a mechanical execution of the notes, but express the thoughts, the sentiments, and, so to say, give a language to his instrument.

XXIX. As it is impossible for us to enter into the examen of all the mathematic, philosophic, and mechanical rules of the general base, and other parts of composition, we shall endeavour to supply this defect, in some degree, by here giving a short table (taken partly from the Harmonic Generation of M. Rameau) of some terms of the art, which we had not an opportunity to introduce into our analysis, and of which the reader may have occasion to know the signification.

XXX. *Accord* (or concord) *perfect*, or *natural*, is the union of three sounds or notes, that are a tierce or third to each other, as, *ut*, *mi*, *sol*, to which may be added the octave *ut*, if it is thought proper: or the fundamental tone, the third, the fifth, and the octave.

Accord dissonant is that which contains a third more than the perfect, on which side you please.

Accord fundamental is one of the two preceding.

Accord renversed is where the natural order is changed so, that a sound that was grave becomes acute, or betwixt both.

Accord

Accord by supposition is a dissonant accord, disposed on thirds, and under which they add a third or a fifth.

Acute signifies a high sound. The acute is contained in the grave.

Addition. This term implies the note that is added below the perfect accord, to form a dissonant accord.

Aliquant part is the double, triple, quadruple, &c. according to the multiple order of numbers.

Aliquot part is a part of the whole, which follows the order of numbers, and answers to the soumultiple, as half, third, fourth, &c.

Base fundamental, or fundamental sound, is the sound of the whole of any sonorous body, with which naturally resound its aliquot parts $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, and compose with it the perfect concord; of which it is always, consequently, the most grave sound, even when the dissonance is added.

Base general, or thorough base, is a series or progression of varied and renversed notes of the fundamental base. It is a harmony that is produced by the instruments of the base, which play continually while the voice sings, or other instruments execute their parts; or while some of them pause. It was invented and brought into practice, about the year 1600, by an Italian named Ludovico Viadana. It is played on the organ, harpsicord, and all other instruments that are capable of rendering notes in concord at the same time, with figures marked above the notes, or without figures for the other instruments, as the base viol, bassoon, serpent, &c. It is the foundation of all music, and the rules of it require to be carefully studied.

Bemol, or B flat, is a character that diminishes a sound by a semitone minor, without changing its name.

Becarre, or natural or sharp B, is a character which shews that the note, before which it is placed, is to be played a semitone higher than when it is in *bemol*, or flat.

Cadence

Cadence is a kind of repose on a principal or governing tone. There are cadences that are perfect and imperfect, or irregular, and others that are broken or interrupted; but they are all derived from the perfect.

Comma is the least of all the intervals of tone. There are three different commas; one where the proportion is as 80 to 81, being the difference between a tone major and minor; another where the proportion is as 2025 to 2048, and composes with the foregoing that part of a tone, of which consists the difference between a semitone major and minor; the last is that which is attributed to Pythagoras, and of which the proportion is as 524288 to 531441, and serves as a temperament.

Counterpoint is a composition that is harmonious; but more particularly one or more different tunes composed on a given subject. The counterpoint is either affected, imperfect, composite, coloured, unconnected, diminished, single, double, intermixed, figured, confined, syncoped, &c.

Degree is the difference between one sound and another, and is more properly called interval.

The least degree is that which is formed of two sounds, between which neither the octave of one nor the other can be included; for example, 2, 8, are not least degrees, because the acute octave of 2, or the grave of 8, which is 4, may be there included. The least natural degrees are those between which it does not appear that we can naturally insert any other.

Direct interval is that of which the acute sound may be always compared with the fundamental.

Diesis is a character that raises the tone by a semitone minor without changing its name. (See fig. 9. letter *n*.)

Dominant is the fifth of any sound whatever.

Eleventh is the octave of the fourth. This is improperly called the fourth in practice, because that is consonant, whereas the eleventh is here dissonant.

Fundamental

Fundamental sound is that which prevails in a sonorous body, and seems to be the only sound in that body, and of which we perceive at once the unison or octave: it is the lowest of all in the fundamental accord.

Fundamental succession is a succession of fundamental tones.

Forte implies that the part is to be sung or played with force, or that the sounds of the voice or instruments are to be strongly exerted.

Fugue is the name of a certain mode or gender of music, which consists in a mutual imitation of their parts and melodies, which seem to follow and to fly from each other.

Gender. There are two sorts of genders in harmony. The first are those of the major and minor, to which the difference between the third major and minor serve as an origin. The second are the diatonic, chromatic, and enharmonic genders, which have each their particular origin.

Grave signifies a sound of a low or deep tune.

Harmonic proportion is that which is the reverse of arithmetic proportion. It is always continued, that is, composed of three terms only, as $1, \frac{1}{3}, \frac{1}{5}$, whereas that of arithmetic is 1, 3, 5.

Harmonic sound is a sound that is included in the harmony of the fundamental, as its third, fifth, or octave, or even its seventh or sixth major, where use is made of dissonances.

Melody is the tune of a single part.

Monochord is an instrument that has only one string or chord, but where, however, several may be inserted. They mark under that chord all the divisions possible, at least those of which they have any occasion; and with a moveable bridge, which they place under that chord, they divide it into what proportions they please, in order to try the effect.

Mode is that place in the scale or system where each kind of octave begins, or the succession and progress of its seven intervals: for the modes vary according to the different places where the two semitones of the
fifth

fifth are found; which the ancients called *diapason*. There are six modes which may have the fifth below, and six others that may have it above, which make twelve variations of the modes or tones.

Modulation is the changing of one sound to another, according to a regular scale of tones marked by notes. Modulation is determined by rules, which shew what tones are to enter into each scale.

Partition or *score*, which the Italians call *partitura*. This term, which is commonly used to express a system where all the parts are exhibited together, signifies also, especially with regard to the organ and harpsicord, the manner in which the sounds ought to accord with each other.

Piano is the reverse of *forte*, and shews that a sound is to be produced in a soft and tender manner.

Pizzicato is a term that relates to stringed instruments, and shews that a note is to be played without the bow, by pinching the string with the nail or finger.

Principal sound is the fundamental sound, on which all the mode, all the modulation turns; it is always the mean term in a triple proportion; it is the only one in a perfect harmony. In practice it is called the *note of the tone*, or the *tonic note*.

Progression is a succession of a series of terms, always equal among themselves in the same proportion.

Relation is the result of the comparing of two terms, or two sounds; for example, *ut* and *sol* are in the relation of a fifth. The terms which mark this fifth are in the relation of 2 to 5, or of $\frac{1}{2}$ to $\frac{1}{5}$, and so of the rest.

Renverse signifies to change the order between the sounds of a relation, proportion, interval, or accord, in such a manner that a sound that was sharp becomes flat or intermediate.

Semitone. There is a major and a minor semitone: the first is natural, and is called *diatonic*; the other is not so natural, and is called *chromatic*. It makes

makes the difference between the tierce major and minor.

Sonorous body. All those bodies which produce a sound are so called, as the voice, a string, a tube, &c.

Sordini is the method of changing or reducing the sound of an instrument, which is done by placing a small plate or comb of silver, or other metal, upon the bridge of a violin or violoncello, &c.

Soudominant is the fifth downward; and when reversed, the fourth to its principal. In the diatonic order, it is the note which is immediately above the dominant.

Soutonic bears to the tonic the same relation we have explained in the soudominant.

Staccato is a term in the Italian music, which signifies that the tones are to be sounded by small intervals, each separately, without uniting them, and in a manner lively and accented.

Syncope signifies the division of a note which is made, 1. when two or more notes of one part answer to one note of another, as when a semibreve answers to two or three crotchets, or double crotchets; 2. when a note has a point placed at the side of it, which increases it by half its common value; 3. when a note is connected with another note on the following bar; or, 4. when the same note continues through one or more bars, while the other parts play different notes which are in harmony with it. From hence it plainly appears what is meant by *syncoped notes*, &c.

Tonic note. This term answers in practice to that of *principal sound*.

Tuning an instrument is the raising its strings to that tone which they must have to produce harmony.

Temperament is the manner of modifying the natural relations of intervals, so that the same sound may, at the same time, serve for a third to one, and a fifth to another.

Tetracord properly signifies the third, and is a consonance or interval of three tones. This word implies also a rank or order, or, more properly still, a part of the general system composed of four diatonic chords, sounds, or voices; which are otherwise called fourths.

Valuing a sound signifies the distinguishing the degree of a tone of that sound so that we can, without other help, sound its unison or octave.



C H A P. IX.

P A I N T I N G.

THAT happy expression of Horace, *ut pictura, poesis*, has been constantly repeated by every writer on those two liberal arts; and in fact it cannot be denied but that in many respects they appear to resemble each other. These similitudes, however, arise principally from certain ingenious comparisons, which exist more in a poetic imagination than in nature, are rather happy fictions than real truths. Comparisons never constitute proofs. The same may be said of many florid definitions which the poets have given of painting; as by calling it an art that animates the cloth by colours; or a dumb art that speaks to the eyes only, &c. All these poetic definitions afford but little information, and lead those who are desirous of instruction very far from the truth. *Painting is the art of representing to the eyes, by means of figures and colours, every object in nature that is discernible by the sight: and of sometimes expressing, by figures, the various emotions of the mind.* Painting, therefore, consists, as well as poetry, in an *expression by fiction*. But it acts by a different sense; it excites ideas in the mind by a different organ than does poetry, which operates by the ear. It follows, therefore, that the whole system of the art of painting must be very different

ferent from that of poetry, and all other arts that affect the mind by the sense of hearing.

II. All the precepts, that we have given in the first chapter of this book for the polite arts in general, are, notwithstanding, strictly applicable to painting; and we must desire our readers here carefully to recollect them, that we may avoid a repetition, which would be disagreeable both to them and ourselves. Beside those general precepts, the art of painting has its particular system, which is the ground of all its productions; the analysis of which will make the subject of this chapter. The parts of this system consist, 1. in the invention of a picture: 2. in the poetic composition: 3. in the disposition: 4. in the observance of the *costume*: 5. in the arrangement of the groups: 6. in the drawing: 7. in the drapery: 8. in the colouring: 9. in the tone, the *clair obscur*, or the effects of light and shade: and, 10. in the expression of the passions and emotions of the mind by the countenance. If we can clearly explain all these matters, we think we shall furnish our readers with a sufficient idea of this art; the most admirable, perhaps, that has ever been invented by mankind; an art so noble, and so excellent, that in ancient Greece it was not lawful for slaves to attempt it. But before we proceed to the analysis, we shall give, in a few words, what history informs us of the origin of this charming art.

III. It is to be imagined that men must naturally and very early have conceived an idea of the first principle of the art of painting: the shadow of each plant and animal, and of each edifice, must have afforded them the means of conceiving the method of imitating the figures of all bodies whatever. But as in the first ages of the world the art of writing was unknown, as mankind were ignorant of astronomy, and as their year certainly did not consist of the same number of days as does that of the moderns, how is it possible now to determine the epoch, the precise date of the rise of each art or science? The almanacs of the first inhabitants of the earth were, most probably,

bably, very different from ours; they did not attempt there to mark the date of each invention with that precision and boldness that we do. The Egyptians pretend that painting was in use among them many ages before it was known to the Greeks, and the matter is highly probable; for the Egyptians being the most ancient people, the Greeks drew from them many other branches of learning; the hieroglyphics of the former were, moreover, a sort of painting. Diodorus Siculus, l. ii. c. 4. relates, that Semiramis, having re-established Babylon, built there a wall of two leagues and a half in circumference, the bricks of which were painted before they were burnt, and represented various kinds of animals. He adds, that she had another wall, on which were the figures of all sorts of animals painted in their natural colours: and that there were among them even pictures which represented hunting matches and combats. This is, in fact, an anecdote of great antiquity.

IV. The Greeks were acquainted with the art of writing: they were highly ostentatious, and had among them men of real genius. This was sufficient to make them attribute the invention of all the arts and sciences to themselves. Their authors, however, do not agree about the inventor of painting. Pliny, in his Natural history, l. xxxv. c. 12. assures us, that Dibutades, a potter of Sicyonia, invented the art of making figures in clay; but that he owed the invention to his daughter, who, on taking leave of her lover that was going to a distant country, contrived to trace on a wall, by the means of a lamp, the outline of his shadow: the father, by applying his clay to those lines, formed a statue, which he hardened in his stove; and which was preserved in the Temple of the nymphs, till the time that Mummius signalized himself by the destruction of Corinth. Love, therefore, was the first master of painting; and that God seems, at this day, to have renewed in France that method of the Greeks, by those portraits drawn from shadows, which they call *a la Silhouette*. It should seem, however, that neither the Greek historians, nor Pliny, were

were acquainted with that book of Moses intituled Genesis, for they would have there seen, in the thirty-first chapter, that Rachael, the wife of Jacob, stole from her father Laban his images, or little figures of household Gods; which was in the time of the highest antiquity: that Aaron afterwards made in the desert a golden calf; that the ark of the covenant of the Hebrews was ornamented with figures of cherubims; that Moses forbade the people the use of images: all of which supposes a knowledge of design.

V. Be this as it may, if we are to judge by all the paintings of antiquity that have come down to us, and in particular those that have been lately discovered in the ruins of Herculaneum, the paintings of the ancients did not nearly equal those of the moderns. For if we except the correctness of design in which the Greeks excelled, as is apparent by their statues, and the expressions of the passions by the countenance, the first invention of which is attributed to Aristides, all the other parts of their paintings are far inferior to the moderns. There is no appearance of any knowledge of perspective, or gradation in the several plans of a picture; the clair obscure appears to be carelessly applied, &c. They had, moreover no knowledge of the art of painting in oil; for that was not invented till about the middle of the XVth century, by John von Eick, a native of Maestricht in the bishopric of Liege. Till then they could paint only in chalk, or in stucco, as *al fresco*; or, at most, with colours mixed with the white of an egg, gum, or paste, &c. All this could produce a dead colouring only, when compared with a picture of Rubens or Titian painted in oil. Apelles, who is called the prince of painters, and lived in the CXXth olympiad, about 300 years before Christ, would not, perhaps, be vastly admired by a modern connoisseur, who has studied the *chef-d'œuvres* of the Italian, French, and Flemish schools; and there is but little appearance that a German horse, who is not usually excited to neigh by the sight, would do it on seeing a mare painted by Apelles: or that Alexander would have preferred

ferred him to Rigauds or La Tour to paint his portrait. The Greeks were naturally vain-glorious ; and they knew of nothing better. Be that, however, as it may, the art of painting, imperfect as we suppose it, was entirely lost during the time the barbarians over-ran Europe. Cimabue, a painter of Florence, born in the year 1230, was the first who laboured to re-establish it. The golden days of Leo X. Charles V. Francis I. and Henry VIII. all cotemporaries, became the epoch of its perfection.

VI. It is therefore of the different parts of this art, thus re-established, extended and improved, that we are here to treat. To learn to paint we must begin with drawing, proceed to colouring, and finish by the study of composition : but in the practice we must begin with the composition of the picture, proceed to the drawing, and finish with the colouring. We shall here follow the last order. In the first place, therefore, *Invention* consists in the choice of the subject on which the painter proposes to form his picture. But as all the objects in nature are susceptible of imitation by the pencil, the masters of this art have applied themselves to different subjects, each one as his talents, his taste, or inclination, may have led him. From whence have arose the following classes of painting :

VII. 1. *History painting* ; which represents the principal events in history, sacred and profane, real or fabulous ; and to this class belongs *allegorical expression*. These are the most sublime productions of the art, and in which Raphael, Guido, Rubens, Le Brun, &c. have excelled.

2. *Rural history*, or the representation of a country life, of towns and villages, and their inhabitants. This is an inferior class, and in which Teniers, Breughel, Watteau, Pater, &c. have great reputation, by rendering it at once pleasing and graceful.

3. *Portrait Painting* ; which is an admirable branch of this art, and has engaged the attention of the greatest masters in all ages, as Apelles, Guido, Van Dyke,

Dyke, Rembrandt, Regauds, Pefne, Kneller, La Tour, &c.

4. *Grotesque histories*, as the nocturnal meetings of witches; sorceries, and incantations; the operations of mountebanks, &c. a sort of painting in which the younger Breughel, Teniers, and others, have exercised their talents with success.

5. *Battle pieces*; by which Huchtemberg, Wou-
verman, &c. have rendered themselves famous.

6. *Landscapes*; a charming species of painting, that has been treated by masters of the greatest genius in every nation, as Pinacker, Reusdahl, Vandervelde, Dubois, &c.

7. *Landscapes diversified with waters*; as rivers, lakes, catafacts, &c. which require a peculiar talent to express the water sometimes smooth and transparent, and at others foaming and rushing furiously along.

8. *Sea pieces*; in which are represented the ocean, harbours, and great rivers; and the vessels, boats, barges, &c. with which they are covered; sometimes in a calm, sometimes with a fresh breeze, and at others in a storm. In this class Backhuysen, Vandervelde, Blome, and many others, have acquired great reputation.

9. *Night pieces*; which represent all sorts of objects, either as illuminated by torches, by the flames of a conflagration, or by the light of the moon. Schalck, Vanderneer, Vanderpool, &c. have here excelled.

10. *Living animals*; a more difficult branch of painting than is commonly imagined, and in which Rosa, Carré, Vandervelde, and many others, have succeeded marvellously well.

11. *Birds of all kinds*; a very laborious species, and which requires extreme patience minutely to express the infinite variety and delicacy of their plumage.

12. *Culinary pieces*; which represent all sorts of provisions, and animals without life, &c. a species much inferior to the rest, in which nature never appears

pears to advantage, and which requires only a servile imitation of objects that are but little pleasing. The painting of fishes is naturally referred to this class.

13. *Fruit pieces*, of every kind, imitated from nature.

14. *Flower pieces*; a charming class of painting, where art in the hands of Huyzum, P. Segerts, Merian, &c. becomes the rival of nature. *Plants* and *insects* are usually referred to the painters of flowers, who with them ornament their works.

15. *Pieces of architecture*; a kind of painting in which the Italians excel all others. Under this class may be comprehended the representations of ruins, sea-ports, streets, and public places; such as are seen in the works of Caneletti, and other able masters.

16. *Instruments of music*, pieces of furniture, and other inanimate objects; a trifling species, and in which able painters only accidentally employ their talents.

17. *Imitations of bas-reliefs*; a very pleasing kind of painting, and which may be carried, by an able hand, to a high degree of excellence.

18. *Hunting pieces*: These also require a peculiar talent, as they unite the painting of men, horses, dogs, and game, to that of landscapes.

VIII. That different effect which the same objects of nature have upon different men, produces what is called the *different manners* of painters of the same class. These manners, which consist principally in the various kinds of colouring, in the tone, and the method of composing and grouping of figures, are so very diversified, and at the same time so distinct, so determinate among artists, that every connoisseur is able to distinguish the hand, and to name the master, on the first inspection of a picture. It is a particular style to which each painter habituates himself, and never entirely quits, and is far more easily distinguishable than the style of a poet or other writer. The connoisseur, however, does not acquire this faculty of discerning the pencil of each celebrated painter, but by means of having seen a great number of paintings; of regarding them with a careful and critical eye,

eye, and by making repeated reflections on the different manners of the several masters.

IX. Let us return to the Invention. This is necessary in all the species of painting that we have here enumerated, in order to make choice of such subjects as are most proper for each class. Now this picturesque invention is of three kinds, *historic*, *allegoric*, or *mystic*. The painters make use of the term *historic invention*, not only for the subjects of history, but for the representation of all real objects, such as nature in fact produces, as animals, flowers, fruits, landscapes, &c. *Allegoric invention* is the choice of such subjects as serve to express in a picture, either wholly or in part, other matters than what they really represent, as virtues and vices, passions, happiness, misery, &c. *Mythic invention* relates to religion, and serves to represent, under sensible images or figures, some dogma, or mystery, founded on the scriptures. An example of each kind will explain, better than many words, what is meant by these distinctions.

X. It is now a long time since I conceived the subjects of two grand historical pictures, but have never yet met with any painter that was willing to undertake the execution. The one was to represent Dido abandoned by Æneas. In the back ground of the picture was to be seen Carthage in flames. On one side of the fore ground appears the queen in despair, and ready to throw herself on the pile, which is placed on the border of the river, and is already on fire: Behind her stand her female attendants bathed in tears. On the other side are seen Æneas and his followers, in their galleys, rowing on the sea, and retiring by the force of their oars. A mournful silence is strongly marked in their countenances. There reigns throughout the picture an austere and gloomy tone. The country appears rough and barren; nothing is seen but arid sands, with here and there a solitary palm tree half burned up. The air is darkened with thick clouds, and the sea enraged. Every object has the look of grief and terror. The lights and shades, and all the passions, are strongly expressed.

expressed. In a word, every part of the scene is filled with horror. The companion and contrast to this picture was to represent the voyage of Cleopatra, when that fair Egyptian queen sailed down the river Cydnus, in a vessel whose head was of gold, the sails of purple, and the oars of silver, and was surrounded by a number of musical instruments, that kept time to the sound of the oars. She is going to Cilicia in quest of Mark Antony, and with the design to make the conquest of that conqueror. She is seen reposing under a canopy of gold tissue, and in a dress that is at once highly superb and elegant. Young children, such as in painting represent the Loves, surround her, and excite with fans the refreshing breeze. The most beautiful of her ladies, in the habits of the Nereides and Graces, are distributed about the different parts of the vessel. The time and place of this scene should be that when this queen landed before the city of Tarsus; the inhabitants of which, taking her for the goddess Venus, came forth to meet her, and to do her homage, by burning the richest perfumes on the borders of the river. The sky serene and bright, the sea calm, the banks of the river embellished with flowers and myrtles, the splendor of the vessel, the elegant attire of the queen and her attendants, the musicians, the inhabitants of the city, the women and virgins adorned with flowers, all seem to concur to render this picture as graceful and elegant, as gay and brilliant, as it is possible for the imagination of a poet or the art of a painter to produce.

For an example of an allegorical subject, I shall here describe a picture of the School of Venice, which is in the possession of one of my friends. It represents the Genius of Italy sleeping. The Genius is painted on the fore-ground, as a tall and beautiful figure, lying prostrate on the earth, and is strongly characterized by such ornaments and attributes as are peculiar to it. On the back-ground are seen the Sciences and the Arts, who are flying from Italy while its Genius sleeps. Every art is admirably described by its attributes. The composition, the design and colouring,

colouring, in every part of this piece, are highly pleasing. Those pictures of Rubens in the Luxemburg gallery, which represent the Felicity of the Regency, Time discovering the Truth, and the Apotheosis of Henry IV. are also master-pieces of allegorical painting.

Lastly, As an example of a mystic subject, I shall give the description of a picture which M. de Piles mentions in his introduction. It represents the mystery of the incarnation, and the annunciation to the holy Virgin. Mary is kneeling on a part of the floor that is somewhat elevated, when she receives the message from the angel, with a look of dignity, mixed with awe and humility. God the Father appears seated majestically in the clouds, resting on the globe, surrounded by the celestial host, and having on his right hand the Justification, and on his left that Peace which he has vouchsafed to bestow on mankind. He sends his Holy Spirit to perform this grand mystery, which is surrounded by a circle of angels joined hand in hand, and rejoicing to know that the fallen angels should be replaced by blessed spirits. Other angels, who terminate this celestial part of the picture, bear in their hands the emblems of those qualities which the catholic church attributes to the holy Virgin, to shew that she was worthy of that grace which was bestowed upon her. This sublime scene fills the upper part of the picture. Below are seen the patriarchs who longed to behold the coming of the Messiah, the prophets who foretold it, and the sybils who declared it, accompanied by infant tutelary genii, who compare the passages in the sybils with the predictions of the prophets.

XI. Beside those general precepts of invention that we have mentioned in the preceding chapter, there are also some particular rules relative to painting. In historic invention, for example, the artist should observe, 1. *Unity*, that is, he should not represent, in the same picture, more objects than it is possible for the eye to discover in nature at the same time; and should also take care that all the objects and persons

that are there found have a relation to the hero of the piece ; 2. *Perspicuity* in expressing the subject, so that a spectator, though but little versed in history, may know at once the event that the painter intended to represent ; 3. *Fidelity*, which consists in a true representation of the circumstances that attended any event, according to the accounts of the best historians. In the second place, with regard to allegorical invention, it is necessary to observe, that the representation be, 1. intelligible ; 2. founded on respectable authorities ; and, 3. necessary. In the third place, with relation to mystical invention, 1. the subject should be pure, that is, free from any mixture of fabulous incidents ; 2. founded on scripture, or on the history of the church ; and, 3. the expression should be grave, decent, noble, and majestic. In a word, the invention in all the three classes should appear to be the production of a fruitful genius, and to be produced without pain or labour ; a quality that seems in some degree to be wanting in that celebrated and admirable picture of Raphael of the School of Athens.

XII. The invention of a picture, or the choice of a subject, according to the rules we have here laid down, and the judicious and ingenious arrangement of the several matters that each subject affords, is what is called, in a collective sense, the *poetic composition* of a picture. How happy soever the choice ~~may~~ be, and how fruitful soever the subject, it will produce a disinteresting picture only, if it be not composed by an able artist, who, independent of the drawing and colouring, knows how to dispose the objects with taste, and to avail himself of every advantage his subject presents ; and this is what is called *ordonance* or disposition. This ordonance serves clearly to explain the idea of the subject in the execution ; to avoid disorder and confusion ; to place and characterize the principal persons or objects so that they may at once strike the spectator, and fix his attention ; properly to observe the different grounds of a picture, and their gradations ; not to leave some parts
empty,

empty, and have others crowded, but so to dispose the several parts, that the whole may form one graceful harmony. The figures, moreover, should not only be well disposed, but appear necessary to the subject, and not placed there merely to fill up empty spaces. In a word, the whole composition should appear to be cast in one mould, or to have proceeded at once from the brain of its author. This ordonnance has, therefore, some essential particulars, which it is here necessary to explain.

XIII. In the first place, there should be religiously observed what the painters call the *costume*, that is; the art of treating each subject according to that manner which is peculiar to it, by conforming to the customs of different times and places. The greatest masters have sometimes transgressed this rule. We have seen a picture, for example, representing our Saviour going from Jerusalem to the place of his crucifixion, and bearing his cross between two capuchins; another of the siege of Samaria by Holofernes, where the painter has placed a battery of cannon; Abraham going to slay his son Isaac with an arquebuse, in order to offer him as a sacrifice; and a thousand other like incongruities. The costume is likewise violated when, without necessity, fabulous or allegorical matters are united with real history; as when in a sea port, instead of sailors, are seen Tritons, Syrens, and all the attendants on Neptune or Amphitrite; or when winged Cupids are introduced in a landscape, or at a country wedding; &c.

XIV. *Groups* arise from the combination of various objects, from the union of several persons or things in one point of view, or in one place. The conversations and connexions of mankind induce them to come together, as does the natural instinct of all animals that live in society; the painter, therefore, is obliged to form them into groups. It is impossible, however, to give any clear, determinate rules with regard to the arrangement and formation of these groups. This is a matter of practice; and the works

of the greatest painters, as Raphael, Julio Romano, Polydore, &c. who have excelled in this article, will serve at once as precepts and examples. The only maxims that can here be given may be reduced to these ; 1. that in each group the principal objects and most interesting persons should be most conspicuous ; 2. in each arrangement the painter should display as many of the pleasing objects of nature as the subject will admit ; 3. in the disposition of these groups the attitudes should be natural and graceful ; 4. that the most perfect groups are those where the different objects, with their different attitudes and expressions, are the most happily contrasted ; and, 5. the union of all these particular groups should form one general group, which is called *a whole*, and in which consists the perfection of the poetic composition of a picture ; founded on that pleasing harmony which runs through all its various parts.

XV. Painters use the word *design* to express three different meanings. Sometimes they intend thereby the whole draught or composition of a picture ; sometimes the figure of a part of the human body, or other object, formed after nature, which serves as a model to their disciples ; and sometimes they mean the contour or outline, by which the figure and proportions of a body are determined : and it is in this last sense that we here use the word *design*. Now, as the formation, and, so to say, the existence of all figures, depends on the design, it follows that it is the first principle, the foundation of painting. The design, in general, has therefore six parts, the observation of which are absolutely indispensable.

1. *Correction*, or precision in the forms and dimensions ; founded on those of proportion, and on the knowledge of the structure of the human body.

2. *Taste*, of which we have treated in the preceding chapter. Each school has its peculiar taste in the design ; and since the re-establishment of the polite arts, that of Rome has constantly been regarded as the most excellent, being formed on the antique.

3. *Elegance*

3. *Elegance and grace*, and what the Italians name in painting *svelto*.

4. *Variety*, in the positions of figures, and the points of view from which they are seen.

5. *Expression* of that character which is proper and peculiar to each object.

6. *Perspective*, or the position of each object according to the different points of distance from whence it is supposed to be viewed.

The knowledge of design is to be learned but by practice only. All rules whatever are insufficient, and will never form a good designer. It is to be learned under the inspection of an able master, who will guide and correct; or by designing in academies, after models, prints, drawings, statues, antiques, bas-reliefs, living figures, &c. There are celebrated academies in Italy, France, and other nations, where the disciples of Apelles learn to design, and where they may acquire a great proficiency in this art. We have in Germany a very instructive work on this subject, intitled, *The practice of design, founded on theory, by John Daniel Priestler, of Nuremberg: to which is added a translation of the Anatomia del Pittori del signor Carlo Cefio; with many copper-plates.*

XVI. The diversity of dresses among different nations, and in the different ages of the world, and the variety of stuffs that have been made use of for that purpose, have given rise to a particular branch of painting, which is called the *art of casting the drapery*: by that is meant the manner of so disposing the stuffs that form the dress, that the contours and folds may seem to be the effect of chance, and not the studied arrangement of art. In painting the drapery there are, therefore, four things to be observed.

1. The graceful disposition of the folds.
2. The nature of the different stuffs.
3. The variety of colours in those stuffs; and,
4. The different lights and shades, and masses of light which those objects naturally produce.

XVI. The *colouring* is an essential part of painting, the knowledge of which enables the painter to

imitate the apparent colours of all natural objects, and to give to such as are artificial those colours which are most proper and best adapted to produce the illusion of the sight. This part of painting includes the following articles.

1. The knowledge of the simple and natural colours.

2. Of the natural sympathy and antipathy that is to be found among colours.

3. Of the method of uniting the simple colours to produce such as are mixed; demi-tints, shades, or gradations of all sorts of colours.

4. The knowledge of local colours, or those which each body derives from its situation, and which frequently give a much stronger effect to other neighbouring colours.

5. The method of properly disposing all the various colours, so as to produce the greatest effect possible.

XVIII. The knowledge of the *clair obscure*, or the effects of light and shade, which is called the *tone* of a picture, is also a capital object in painting in general. We can discern bodies by the means of light only, and our sight is struck with an object in proportion, as it enjoys a greater or less degree of that light. One body which prevents the light from falling on another, either entirely or in part, produces a shade on that body. This part of painting, therefore, supposes,

1. A general knowledge of lights and shades, as they are produced in nature.

2. A knowledge of the manner in which particular lights fall (arising from the different positions of bodies) on their surfaces, or in different situations, which produce uncommon shadows.

3. That of the reflection and refraction of light, or the rays of the sun.

4. That of the colours of light itself.

5. The observation of the degrees of brightness or obscurity, or the degree of shade that colours contain in themselves, and in the objects they are intended

tended to paint. All this knowledge furnishes a painter with the means of imitating nature, not only as it appears to the eye, with all its lights and shades, but also to form pleasing masses of the clear obscure, and to give a true and striking tone to his picture.

XIX. Lastly, *the expression of the passions and emotions of the mind*, is a very important article in painting. Without this no subject can be successfully treated; the whole performance will remain cold, insipid, lifeless. There are in the academies, for the use of the students in painting, models, drawings, and prints of the principal passions to which man is subject, as joy, grief, rage, meekness, love, hatred, &c. which are not only expressed by the countenance, but by the different attitudes of the body; and the study of these is highly instructive. But as the motions or position of the muscles, in the different features of the face, discover almost always the emotions of the mind; and as the physiognomies of men are almost infinitely diversified, the able painter will constantly study them as they are exhibited by nature itself.

XX. We cannot avoid remarking here, that every visible object in nature has its peculiar physiognomy, which seems to declare to the eye its intrinsic value, and which is more especially manifest in the extremes. A man of keen discernment has a different aspect from an idiot; a philosopher from a debauchee; an amiable woman from an affected coquette; a vigorous stallion from a slender race-horse; a blooming flower from one that is withered; and so of the rest. Every painter, therefore, should take particular care justly to express that peculiar physiognomy which shews the perfection of every object that he draws, and by which he proposes to excite pleasure in the beholder. This remark, which we shall extend in considering the expression of character in portraits, is perhaps of more importance in practice than may at first appear.

XXI. We have enumerated, in the seventh section, the various objects of nature on which the painter exercises his pencil, and which form so many different branches of his art. When the limits of this work are considered, it will not be expected that we should here give the rules that the painter is to observe in treating each particular subject. What we have said on historical painting may throw some light on the rest, and the particular rules must be learned from the study of the art itself. Good books and good masters, academies of reputation, and a rational practice, are the sources from whence the young painter must derive the detail of his art. We shall, however, here give some detached observations relative to these particulars.

XXII. The painter of portraits should draw a faithful copy of nature in its minutest circumstances. He should, therefore, endeavour to produce, 1. the greatest resemblance of the original possible; 2. to choose that point of light, and seize that moment of time, which are most advantageous for the original; 3. to endeavour lively to express that character, which is predominant in each countenance, and which, so to say, there paints the mind; 4. not to depart, however, from nature, but to adhere to that which is true and unaffected; 5. not to sacrifice too much or too little to ornament, but to remember, that nature, when too much decorated, becomes less natural; 6. whether he paint a head only, or a half figure, or a full length, or a family piece composed of several persons, he should constantly have regard to the air of the head, the looks, the colouring, the attitude, and the drapery, that each part may be correct and graceful, and that they may all have a relation and harmony among themselves.

XXIII. Landscape painting includes every object that the country presents. It is distinguished, moreover, into the heroic, pastoral, and rural style, the simple and refined, &c.

The painter should here observe the *sìte*, which is a word borrowed from the Italian, and signifies the view,

view, the disposition, or scene of a landscape ; 2. the *accident*, by which is meant, in painting, the interruption of the light of the sun by means of clouds ; 3. the sky, the distant views and mountains, the rocks, waters, the buildings, the ground of the picture, the plants, trees, figures, &c. The rules relative to all which are carefully to be studied in order to become a good landscape painter.

XXIV. We cannot finish this article without saying a few words on the painting of theatric decorations. This is a particular art, which unites several of the general arts of painting with the knowledge of architecture, perspective, &c. Servandoni and Bibiena, in our days, have excelled in this art : they, who apply themselves to it, would do well to design their decorations by day, and to colour them by candle-light, as they will be much better able to judge of the effect of a painting intended to be viewed by that light. It is proper also to caution the young painter to avoid, as much as possible, the uniting the imitations of nature with nature itself ; that is, he should not introduce with his decorations, living horses, or other animals, real fountains or cascades, trees or statues, &c. For such combinations are the effect of ignorance and a bad taste ; they are the resources of painters of little ability ; they discover a sterility of invention, and produce great inconvenience in the representation. Those pieces which they call moving pictures, where the painted landscape remains immoveable, and the figures move by means of springs, form a part of these decorations ; and there are some of them, as those of Antwerp and Ghent, that have a pleasing effect.

XXV. The designs for stuffs, furniture, embroidery, carriages, porcelain, and other branches of manufacture, form also a very important article of painting in general, and of academy painting in particular. This is a distinct branch of the art, and, without doubt, the most useful of all its parts, as it concurs so essentially to the success of manufactures, and consequently to the prosperity of a state : and it

is an art, to which it were much to be wished that youth of ability and invention would apply themselves; but of which it is impossible for us here to explain the particular rules. We shall now hasten to the conclusion of this analysis, by describing the different methods of painting, or the different means that painters make use of to imitate all visible objects on a plain superficies. There are, therefore, now in practice,

1. Painting in oil; which is preferable to all other methods, as it is more susceptible of all sorts of expressions, of more perfect gradations of colours, and is at the same time more durable.

2. Mosaic painting; an invention truly wonderful; it is composed of a great number of small pieces of marble of different colours, joined together with stucco. The works of this kind are made principally at Rome, where this art has been carried so far as to resemble the paintings of the greatest masters; and of these are made monuments for the latest posterity.

3. Painting in fresco; which is by drawing, with colours diluted with water, on a wall newly plastered, and with which they so incorporate, that they perish only with the stucco itself. This is principally used on cieling.

4. Painting in water colours; that is, with colours mixed with water and gum, or paste, &c.

5. Miniature painting; which differs from the preceding only as it represents objects in the least discernible magnitudes, and is consequently vastly more delicate, seeing it is performed by the smallest strokes possible; whereas the others have the full scope of the pencil.

6. Painting in crayons; for which purpose colours, either simple or compound, are mixed with gum, and made into a kind of hard paste, like chalk, and with which they draw on paper or parchment. La Rosalve and La Tour have given the world such chefs-d'œuvres of this kind, that it is to be lamented there is no way yet found to fix these colours,
and

and to prevent their delicate shades from being lost in dust.

7. Painting in enamel; which is done on copper or gold, with mineral colours that are dried by fire, and become very durable. The paintings on the porcelain of China, and Europe, on delph ware, &c. are so many sorts of enamel.

8. Painting in wax; this is a new invention, and of which there are in France performances highly pleasing. It is done with wax mixed with varnish and colours.

9. Painting on glass; which is called *peinture d'aprest*, and of which there are various kinds.

XXVI. Thus we think we have given our readers a general idea of painting. As we have not found opportunity, in explaining its several parts, to introduce all the terms of the art, we shall here supply that defect in part, by setting down some of these terms in an alphabetical order, together with a succinct explanation.

Air of a head is that disposition of the features, the aspect, the proportions and harmony of parts, that render a head agreeable, noble, graceful, &c. The ancients excelled in the airs of a head, as do the great modern Italian masters.

Camayeu is a picture painted in one colour only, and, and where all the lights and shades are justly observed.

Caricatura is the representation of a picture exaggerated in some of its parts, and is nearly what the French call charged.

Charged signifies in painting the representation of any object that is exaggerated, but where there is frequently a ridiculous likeness preserved. These charges constantly vary from the truth, and there are but few painters who have the address to manage them with propriety.

Mezzotinto, or *demitint*, is a certain management of the light with regard to the clair obscure, or a middle tone between light and shade. If there are five tones or degrees of clair obscure, the second
and

and third which follow the great light, are called *demitints*.

Plane: they call in painting a *geometric plane* that figure which a body describes on the ground in its proper form, and the line on which it is raised is called the *ground line*. A *perspective plane* is that in which a figure appears at the same height with the eye, and in which is the line of view; and when the eye is much elevated, it is called a bird's view.

Relievo: there are *basso relievos*, *alto relievos*, detached parts, and entire figures, which serve as models for designing. The copying or designing a figure after any of these, is called working after a model.

School is a term used in painting to distinguish the different manners of places or persons. The most famous schools are those of Rome, Lombardy, Venice, Flanders or Germany, and France. The other nations of Europe have no schools that bear their name. They say also a picture of the school of Raphael, Titian, Carracci, &c. by which is meant, that it was painted by one of their disciples.

Sketch is the first tracing of a picture, or the first idea of a design. There are two sorts of sketches, the one is with chalk, and the other in colours; the latter is an essay of a larger work which the painter meditates.

Studies are different designs of figures, or essays that painters make of parts of some great work. So they say the studies of Michael Angelo, Rubens, &c. or a collection of the studies of great masters, &c.

Tints are the manner of applying the colours to give a relief to figures; to make the lights and shades, and distances, appear distinct. This is one of the great secrets in painting. They say, likewise, a good tint, to express the colour of an object that is strong and vivid.

Union is the just symmetry and disposition of all the parts of a picture, as well with regard to the figures as the colouring. This is also called *harmony*.

C H A P.

C H A P. X.

ENGRAVING.

WHETHER we consider the art of engraving, with regard to the utility and pleasure it affords, or the difficulty that attends its execution, we cannot but confess, that on every account it deserves a distinguished rank among the polite arts. It is by means of this art that the cabinets of the curious are adorned with the portraits of the greatest men of all ages and all nations, that their memories, their most remarkable and most glorious actions, are transmitted to the latest posterity. It is by this art also that the paintings of the greatest masters are multiplied to a boundless number, and that the lovers of the polite arts, diffused over the face of the whole earth, are enabled to enjoy those beauties which their distant situations seemed to have for ever debarred them; and persons of moderate fortune are hereby enabled to become possessed of all the spirit, and all the poetry, that are contained in those miracles of art, which seemed to have been reserved for the temples of Italy, or the cabinets of princes. When we reflect, moreover, that the engraver, beside the beauties of poetic composition, and the artful ordonnance of design, is to express, merely by the means of light and shade, all the various tints of colours and clair obscure; to give a relief to each figure, and a truth to each object; that he is now to paint a sky serene and bright, and then loaded with dark clouds; now the pure tranquil stream, and then the foaming, raging sea; that here he is to express the character of the man, strongly marked in his countenance, and there the minutest ornament of his dress; in a word, that he is to represent all, even the most difficult objects in nature; we cannot sufficiently admire the vast improvements in this art, and that degree of perfection to which it is at this day arrived.

II. The

II. The invention of this art is said to be owing to chance ; that in the 15th century a goldsmith of Florence, who was in much esteem with pope Innocent X. having placed a sheet of oiled paper under a plate of silver that was engraved, and on which, by accident, he had laid a heavy weight, was much surprized to find, a few days after, a complete impression of the plate upon the paper. This he communicated to some able painters, his cotemporaries, who, profiting by that example, laid the first foundation of the art of engraving ; which Raphael in Italy, and Albert Durer in Germany, greatly improved, and which the Italian, French, and Flemish masters, such as Michael Angelo, Edelingk, Rembrandt, &c. have successively carried to the highest degree of excellence. We give this account of the origin of engraving as we find it in authors of the greatest reputation ; but we must not here omit to inform our readers, that we have seen prints graved, it is true in wood, but executed long before the time of Maso Finiguerra, as is evident by their printed dates.

III. It will not be expected that we shall much extend our remarks on this art, as it has many things in common with painting (of which we have just treated) and is, moreover, principally employed in copying the works of the most celebrated painters. It is our business, however, to explain the manner in which the engraver makes his copies, and to shew the wonderful art that he employs in expressing the colours by the different degrees of light and shade.

IV. Engraving, therefore, is the art of imitating, by drawing and cutting lines and points in a hard body, the different lights and shades of all visible objects, in such a manner as to represent distinct figures. There are different methods of effecting this end, which are called, 1. graving in copper with a pointed tool ; 2. graving by aqua fortis, or etching ; 3. graving in wood ; 4. graving in mezzotinto ; and, 5. graving on stones, either concave or convex.

convex. We shall endeavour to give a general idea of each of these.

V. *Graving in copper* is performed on a polished plate of that metal, by means of a pointed iron tool that is extremely sharp, with which the figures and shades of bodies are cut, by drawing lines in every direction, or by points. The points serve to express the demitints and lighter shades; and the strokes, the stronger shades and colours. When the lines cross each other to make the shadow, it is called *hatching*; but this is not esteemed as the greatest perfection in the art. Of all the kinds of engraving, that on copper with a tool is at once the most beautiful and most difficult.

VI. *Graving with aqua fortis*, or *etching*, is likewise done on a plate of polished copper, which is completely covered with white wax, and inclosed in a case with a small rim. They then draw the design upon the wax with a fine tool, or with a needle fixed into a wooden handle, and with which they cut the wax quite through to the copper. When this is done, they pour aqua fortis all over it, which the rim of the case prevents from running off. The plate is left in this state for some days, till such time as the aqua fortis, by eating into the copper, has marked the whole design: it is then poured off, and the plate is placed before a fire, in order to melt the wax; which done, the plate is gently cleaned, and, with a fine tool, those parts are finished which the aqua fortis has not made sufficiently distinct.

VII. *Graving in wood* is done by leaving the strokes prominent, whereas they are cut into the copper: these plates, therefore, are a kind of bas-reliefs, which the graver is obliged to hollow. The same method is used with the forms for cottons, calicoes, paper for furniture, &c. and which may more properly be said to be printed with types than plates.

VIII. *Graving in mezzotinto* is a method that has not been many years established. They take a copper-plate, and, instead of polishing, they grave it
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with a light tool all over, and in every direction, so that the strokes every where cross each other. This graving is to be equal in every part, and consequently, if a proof was then printed, it would be all over perfectly black. The engraver then traces the design, and, with a steel polisher, he rubs off the engraving to different degrees, according to the different lights and shades the several parts require. The English excel all other nations in this kind of engraving.

IX. *Graving in stone* was known to the ancients, and we have still remaining some of their performances of this kind that are worthy of the highest admiration. They are sometimes concave, and sometimes convex. They have, for a long time past, imitated, and even equalled, the ancient engravings on precious stones. Our seals in crystal, cornelian, &c. belong to this class; and it must be confessed, that they have carried this art to a high degree of excellence. A *cameieu* (a term that probably took its rise from Dominico Camei, a celebrated graver in stone, who lived at Milan in the beginning of the sixteenth century) is a stone on which are found figures of landscapes, or other objects, formed by nature. That name is likewise given to precious stones, as the onyx, sardonix, agate, &c. on which gravers employ their art to improve those representations which nature has begun. The gravers of seals, to mention it by the way, work on metals with a steel tool, but on hard stones and crystal with a diamond.

X. The print or impression is made by placing the engraved plate on a sheet of paper, parchment, cloth, or other like substances, and then passing them both together under a press, which imprints the strokes that are in the plate, and which has been previously blacked, and by that means leaves the complete figure on the paper. Those elegant maps, which do so much honour to our age, are executed in like manner on copper-plates, and well deserve the name of excellent engravings.

XI. These maps are properly coloured, in order to distinguish the different countries and dominions, and which

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which have a pleasing and useful effect. The colouring of other prints is, on the contrary, a puerile invention, as such colours can never have a lively and pleasing effect, and serve only to hide the beauties of the engraving. We must except however the anatomical figures, and those of plants, insects, and other objects that relate to physic or natural history, the colours of which the students of those sciences must necessarily be desirous of knowing.

XII. We must not, however, omit to mention a method which is the produce of the present age, and by which they are enabled to print in natural colours the figures of anatomy, flowers, plants, birds, insects, &c. They have at Paris, Augsburg, Nuremberg, and other places, works of this kind, that at once please and astonish, as well those who are, as those who are not connoisseurs in these matters: and it is to be hoped, that they will still further improve this pleasing art.

XIII. We cannot here attempt to explain what may be called the mechanical part of engraving, that is, the methods by which Rembrandt, Raphael, Edelingk, Schmidt, Natiers, Major, Oudran, Willis, Cochin and Hogarth, have been enabled to produce those master pieces of art with which we adorn our cabinets; for to do this it would be necessary to investigate the source of that genius which attends them in all their productions.



CHAP. XI.

SCULPTURE and PLASTICS.

SCULPTURE is the third of those liberal arts that speak to the mind by the means of the sight. Its origin is lost in that obscurity which envelopes the first ages of the world. The most ancient monuments
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of this art plainly prove that it was yet in its infancy among the Egyptians, and among all the primitive people of the known world: that imperfection, which commonly attends new arts, here appears quite conspicuous. Paganism, a religion adapted to promote the polite arts, and to furnish them with agreeable subjects, aided by the happy genius of Greece, enabled that nation to excel in sculpture: All the Gods of the Pagans were represented by statues: Phidias and Praxiteles carried this art to the most sublime degree of excellence: and the statues of Greece, at this day, are in the highest esteem among the connoisseurs, who regard those of Rome, Tuscany, and other parts of Europe, as far inferior both in taste and execution. There is, moreover, this difference between the former and the latter, that the Grecian are almost all naked, and the Roman commonly covered with drapery. The Venus of Medicis, which is also called the shameless Venus, the Grecian Shepherdess, the Gladiator, the Peasant, the Hercules, the Milo of Croton, and the Fawn, are yet to be found in Italy, and they are almost all that have escaped devouring time. To these are given, by way of excellence, the name of perfect statues.

II. By the word *sculpture*, therefore, we understand the art of cutting, with a chisel, in wood, stone, or marble, various representations. Statuary is consequently here included; but we distinguish it from *plastics*, or the art of forming figures by the means of moulds; of which we shall afterwards treat.

III. The subjects of sculpture are therefore,

First. *Statues*: the principal different species and denominations of which it seems proper here to enumerate: They are,

1. Grecian statues, either antique or imitations of the antique; by which is meant a naked statue, such as the Greeks represented their divinities, champions, and heroes. The latter they called Achillean statues, because in most of their cities, there were to be seen a number of the statues of that hero.

2. Roman statues, either antiques or imitations; which are clothed, and receive names from their dress, as those of the emperors, with a large robe over their armour, were called *statuæ paludatæ*; those of captains and knights, with their coats of armour, called *thoracatæ*; those of soldiers, with the cuirass, *loricatæ*; those of senators and augurs, *trabeatæ*; those of magistrates with the long robe, *togatæ*; those of the people, with the simple tunic, *tunicatæ*; and, lastly, those of women, with their long dress, *stolatæ*, &c.

3. Pedestrian statues; which are such as are standing on their feet.

4. Equestrian; such as represent some eminent person seated on a horse.

5. Recumbent; those that are sitting or lying down.

6. Curulean statues are those seated in triumphant cars, or in chariots for the race, drawn by *biges* or *quadriges*; that is by two or four horses.

7. Allegorical statues; such as represent some symbol under a human figure, as the four seasons, the quarters of the world, the ages, fishing, hunting, &c.

8. Aquatic statues; which are those figures that serve to ornament some grotto or fountain, or to perform the office of a pipe, by means of a part from whence water spouts; or by some character which they represent, as Neptune, Amphitrite, Thetis, the Sirens, Tritons, &c.

9. Sacred statues; as the images of our Saviour, the Holy Virgin, the Apostles, Saints, Angels, &c.

10. Colossian statues; or such as are of double or triple the natural size.

11. Persic statues; which are the figures of men, either entire, or as terms, that serve as columns in a building, and are used to support some weight; or to bear some ornaments at the stern of a ship or galley. Vitruvius names them Telamons and Atlas. When statues of this kind represent women, and serve as columns, they are called Caryatides.

12. The

12. The statues or figures of children, genii, angels, &c. A statue, which has a just resemblance of the person it is intended to represent, is called *statua iconica*.

IV. Second. *Groups*, or the representation of several human or other figures, which are connected together, and seen from one point of view. This is the most sublime part of sculpture, or rather statuary.

Third. *Basso* and *alto relievos*, and other works of that kind, which form a sort of sculptured pictures.

Fourth. *Busts*; or the heads of men and women, with the neck, the shoulders, and part of the breast.

Fifth. *Vases*; whether after the antique, or of modern invention, and either plain, or ornamented with bas-reliefs.

Sixth. *Pedestals*; in imitation of those of the Egyptian, Grecian, Tuscan, Roman, &c. or after modern designs.

Seventh. *Animals* of every kind.

Eighth. *Ornaments of architecture*; as foliage, roses, festoons, cartouches, &c. Those ornaments, which are cut on the contour of the moulding, are said to be in *relief*, as sheets of water, &c. and those which are cut into the moulding, are said to be hollowed.

Ninth. *Marine ornaments*; such as fish, shells, reeds, flakes of ice; which serve to decorate grottos, fountains, &c.

Tenth. Ornaments for furniture, equipages, &c. We shall just remark with regard to this article, that the taste for *grotesque* ornaments, which has been frequently carried to an excess, is a disgrace to the art; and a matter in which the most insignificant artist may excel; being nothing more than a collection of figures that have no existence in nature, and whose contours have not any sort of affinity to each other. The fundamental rules of design are, moreover, here constantly violated; and the eye must necessarily be disgusted by a number of buffooneries placed together. On the other hand, they now pur-

sue

fine the *Grecian taste*, perhaps to a degree of excess. A just medium, a judicious variety, constitutes the highest degree of excellence in matters of taste.

V. In every article that we have here enumerated, the sculptor will find occasion for all the knowledge of the art of painting: as the invention or the choice of a subject, the ordonnance, the observation of the costume, the design, the groups; the knowledge of anatomy, and especially of myology, and, instead of the colouring, the equally difficult and accurate management of the chisel. The statuary considers and reconsiders, perhaps a thousand times, a statue, that to the spectator appears to be finished; heedfully examines all its proportions, and minutely marks every eminence that the chisel is yet to raise; corrects, retouches, polishes, and at last so far transforms the stone, that it appears to be no longer marble, but flesh, and even animated flesh. When we consider how much genius, how much art and labour, are necessary to make of a block of marble an animated figure, we cannot but be sensible of the exalted merit of an able statuary.

VI. The painters have frequently denied that the sculptor can have any poetic composition in his work, but they seem to be in the wrong. They imagine, that there are many great and pleasing subjects in sacred, profane, and fabulous history, which cannot be represented by sculpture. But if these subjects even cannot be represented by statues or groups, they may by bas-reliefs, which are real pictures. An able statuary, moreover, can go much further by means of groups than is easily imagined. The man of genius finds a thousand resources, of which the vulgar mind can form no idea. It was proposed, for instance, to a skilful statuary, to form a group representing the fall of Phaeton; the model of which we have seen. The base represented a great rock surrounded by the sea, on which appeared the overturned and shattered car of Phaeton: the mangled horses were seen partly above, and partly beneath the waves. Phaeton himself lay stretched at the bottom of the rock, lifeless,
and

and disfigured with the wounds he had received by his fall. Four beautiful bas-reliefs, on the sides of the pedestal, served more fully to explain the subject, and to render the expression more striking. This may serve as an example for the manner of treating many other subjects.

VII. The statuary should always choose, especially for naked figures, the most perfect forms, whether he work after drawings models, antique statues, or after nature; for nature herself is not equally beautiful in every country, and the artist should constantly endeavour to reform that which may be defective. But the great difficulty in sculpture does not consist in representing a figure in its natural and tranquil state, where each muscle has a determined situation; but when he is to form statues or groups, where the figures are in distorted attitudes, where all the muscles are distended and confused, and where the parts become hollow, and the skin contracted; as, for example, in the rape of Proserpine; in the figures of wrestlers, &c. It is there that the sculptor must exert all his faculties, that the figures, formed after the most exact rules of anatomy, may display a perfect correctness of design.

VIII. How admirable, how perfect soever, we may suppose the antique statues to be, yet they appear to have too much of a manner, with too stiff an air, especially in the drapery, which almost always seems as if it were pasted on the body, and to be too regular in the folds, which are commonly, in consequence of being small, excessively numerous, and disposed in too precise a form. That fine statue of Achilles, in the dress of a woman, under which disguise he concealed himself among the daughters of Lycomedes; which is in the palace of Charlottenburg, appears to me to be faulty in these respects. 'The great, the svelto, the easy, the flowing, gives a wonderful elegance to the drapery of a statue. In general, that which has too much of a manner, is excessively delicate, minute, and laborious, in statuary, never has an air of dignity, or the character of the sublime.

Among

Among all modern statues I know of none where that character, and an air of perfect elegance, are so strongly expressed, as in the Mercury of Pigal, who is putting on the wings to his feet, to execute the commands of Jupiter. This delightful statue is to be seen in the gardens of Sans-souci.

IX. We may, in general, give to statuaries and sculptors the useful caution, not to endeavour to imitate objects that are very minute and delicate; such as feathers, fine threads, a spider's web, small insects, &c. which are very difficult to express in sculpture, and at the same time render it fragile, and of a diminutive character. We would also advise them never to undertake disgusting subjects; as a Marsyas flayed by Apollo; a martyr broiled upon a gridiron, &c. Such objects as these are shocking to human nature, and excite, in persons of any feeling, disagreeable sensations; whereas the design of the polite arts is, as we have elsewhere said, to excite pleasure, and are therefore perverted when they are made to produce horror in the mind.

X. *Plastics* is the art of representing all sorts of figures by the means of moulds. This term is derived from the Greek word *πλαστική*, which signifies the art of forming, modelling, or casting in a mould. A mould, in general, is a body that is made hollow for that purpose. The artist makes use of them to form figures in bronze, lead, gold, silver, or any other metal, or fusible substance. The mould is made of clay, stucco, or other composition, and is hollowed into the form of the figure that is to be produced; they then apply the jet, which is a sort of funnel, through which the metal is poured that is to form the figures, and that is called running the metal into the mould.

XI. It is in this manner, but with much practice and attention, that the artist forms, 1. equestrian and pedestrian statues of every kind; 2. groups; 3. pedestals; 4. bas-reliefs; 5. medallions; 6. cannons, mortars, and other pieces of artillery; 7. ornaments of architecture, as capitals, bases, &c. 8. various sorts of furniture, as lustres, branches, &c. in every

kind of metal : and in the same manner figures are cast in stucco, plaster, or any other fusible matter.

XII. Wax being a substance that is very easily put in fusion, plastics makes much use of it, as well as much abuse. There are impressions, which are highly pleasing, in coloured wax, of medallions, bas-reliefs and alto-relievos, and of detached figures ; which however are somewhat brittle. But this matter has been carried too far ; they have formed moulds to represent the likeness, and the bust of a living person, by applying the plaster to the face itself, and afterward casting melted wax into the mould. Not content with having thus made too-precise a resemblance of nature, they have painted that waxen bust with the natural colours of the face, and have then applied glass eyes and natural hair ; to which they have joined a stuffed body and limbs, with hands of wax ; and have, lastly, dressed their figure in a real habit ; and by these means have produced an object the most shocking and detestable that it is possible to conceive. It is not a statue, a bust, a natural resemblance, that they form, but a dead body, a lifeless countenance, a mere carcass. The stiff air, the inflexible muscles, the haggard eyes of glass, all contribute to produce an object that is hideous and disgusting to every man of taste. Figures like these offend by affording too exact an imitation of nature : and we cannot avoid remarking here, with how much circumspection and restriction we ought to adopt that *principle of imitation* to which M. Batteux has attempted to reduce all the polite arts. In no one of these arts, however, ought imitation ever to approach so near the truth as to be taken for nature itself. Illusion must have its bounds, without which it becomes ridiculous. Whoever shall heedfully reflect on this principle, and apply it to the polite arts, will be convinced that it is just. The celebrated Vandycke was, in my opinion, the most strict imitator of nature that ever existed, either among ancient or modern painters. There is at Hall, in Saxony, an incomparable painting of that master, representing a family composed of seven persons. We

cannot

cannot but wonder at the ability of the artist, who has copied nature with a fidelity and precision of which it is impossible to form an idea without seeing it. But we cannot long contemplate this picture without disgust; we insensibly turn our eyes from it, tired with admiration. Raphael, Guido, and Titian, understood their art much better. They imitated nature to a certain point, but they embellished, they ennobled what they imitated, and at the same time judiciously displayed the traces of their art; they gave a secret, inexplicable charm to their works, which not only attracts, but for ever fixes the spectator's attention. It is for this reason, that we have chose to reduce all the polite arts to the *principle of expression*, rather than that of imitation.

XIII. There is another invention, far more ingenious and pleasing, which is that wherein M. Lippert, antiquary and artist at Dresden, now excels. This able man has found the means of resembling, by indefatigable labour, great expence, and infinite taste, that immense number of stones, engraved, and in camaieu, which are to be seen in the most celebrated cabinets. He has made choice of those that are the most beautiful; and, with a paste of his own invention, he takes from these stones an impression that is surprisngly accurate, and which afterward becomes as hard as marble: these impressions he calls *pasti*. He then gives them a proper colour, and encloses each with a gold rim; and, by ranging them in a judicious order, forms of them an admirable system. They are fixed on pasteboards, which form so many drawers, and are then inclosed in cases, which represent folio volumes, and have titles wrote on their backs; so that these fictitious books may conveniently occupy a place in a library. Nothing can be more ingenious than this invention; and, by this method, persons of moderate fortune are enabled to make a complete collection of all antiquity has left that is excellent of this kind; and these copies are very little inferior to the originals.

XIV. There is also another method of taking the impressions of cameos, medals, and coins, which is as follows: they wash or properly clean the piece whose impression is to be taken, and surround it with a border of wax. They then dissolve isinglass in water, and make a decoction of it, mixing with it some vermilion to give it an agreeable red colour. They pour this paste, when hot, on the stone or medal, to the thickness of about the tenth part of an inch; they then leave it exposed to the sun, in a place free from dust. After a few days this paste becomes hard, and offers to the eye the most admirable and faithful representation of the medal, that it is possible to conceive: they are then carefully placed in drawers, and thousands of these impressions, which comprehend many ages, may be included in a small compass.

XV. The proficient in plastics have likewise invented the art of casting, in a mould, papier maché or dissolved paper, and forming it into figures in imitation of sculpture, of ornaments and decorations for ceilings, furniture, &c. and which they afterwards paint or gild. There are, however, some inconveniences attending this art; as, for example, the imperfections in the moulds which render the contours of the figures inelegant, and give them a heavy air: these ornaments, moreover, are not so durable as those of bronze or wood, seeing that in a few years they are preyed on by the worm.

XVI. The figures that are given to porcelain, delph ware, &c. belong also to plastics; for they are formed by moulds, as well as by the art of the sculptor and turner; and by all these arts united, are made vases of every kind, figures, groups, and other designs, either for use or ornament. The dies, that are used in striking of coins and medals, do not, however, properly appertain to plastics, any more than seals. These dies are of iron or steel, and the art of making them belongs to engraving, as we have elsewhere observed.

C H A P. XII.

ARCHITECTURE.

ARCHITECTURE *is the art of designing a building; of so disposing the plan and elevation, that the edifice may answer the intention of the builder.* The building of a cottage or barn, a stable, or granary, merely simple and substantial, is the mechanical business of a mason or carpenter. The art of Vitruvius, Michael Angelo, Palladio, Vignola and Scamozzi, of Inigo Jones, Schluter and Bott, is exercised on objects far different, and such as may justly be called sublime: on edifices, where invention, a creative genius, and a refined taste, are happily displayed; and it is for this reason, that architecture has been justly ranged among the polite arts. But as the rules of practice, the proportions of the parts of a building and its ornaments, its forms and dimensions, are all *given* by the ancient masters of the art, and as the moderns have not been able to invent any that are more perfect; and all these matters, moreover, being subservient to a strict calculation, a great part of civil architecture (as well as military) comes under the jurisdiction of the mathematicians, who have, in consequence, laid claim to it, and have reduced it into a regular system. We shall therefore consider this art from two different points of view: sometimes we shall examine it as a liberal art, and sometimes as a mathematical science, and consequently subservient to inviolable rules.

II. That an edifice may answer the intention of the builder, it is necessary that it be, 1. *solid and durable*; 2. *adapted to the use for which it is intended*; 3. *of a pleasing appearance*; 4. *that its aspect declare its destination, or, in other words, that it bear the character of the use for which it is designed.* We

shall here examine what rules architecture gives with regard to these four principal objects; and, if we can clearly explain them within the narrow bounds that are prescribed us, we think we shall have given a sufficient idea of the principles of this art.

III. That an edifice may be durable, it is necessary that it be built on a firm ground, and a solid foundation. The choice of the ground is an essential article; and it is quite necessary, that it be properly adapted to the weight that it is intended to bear. A slimy, marshy, or sandy soil, or a situation near the borders of a river, and that is exposed to inundations, are very improper for large edifices. In these cases the only security is, by driving piles deep into the earth; and even that does not always answer the intention.

IV. By the term *materials* is meant every article that is used in constructing any building whatever, as stones, bricks, lime, sand, wood, iron, &c. The first precept of architecture is, that all such materials be of a durable nature, that is, that they be capable of resisting the force of the elements, and particularly of fire, or at least in as great a degree as possible; and that time be given to wood, and stone from the quarry, to become dry and hard before they are used; and in general, that preference be given to such materials as are of a solid utility, rather than such as are more elegant but less durable.

V. The solidity of the foundation demands the architect's utmost attention, as without that the superstructure can have no security. This solidity however should hold a just proportion to the weight that it is intended to sustain, for an excess in this article is not only superfluous, but may disenable the builder from giving a proper finishing to the other parts.

VI. Every thing, which serves to sustain a weight that would otherwise fall to the ground, is called a prop or support; and, when such support is of a round figure, it is called a *column*, or, if only half of it appear without the wall, it is called a *demi-column*. We shall see, further on, how many sorts of columns have been invented by architects. When these

these props are of a square figure, they are called *pillars*; and those, which are placed against, or partly within the wall, are called *pilasters*. A stone that resembles the head of a beam, and that stands out from a wall, or crowns an arch, is called a *console* or *key*.

VII. No part should appear to be stuck on, or to be superfluous to a building; nor should the whole have the air of a number of detached parts brought together. The great art consists in turning that which is necessary, or convenient in a building, into ornament. Every part should have a natural foundation; the walls of separation, for example, which form the different apartments, should not be suspended on the flooring, but rest, in the different stories, on each other. A building should not be ornamented with a pillar where there is nothing to support; nor should a pillar, for want of a proper foundation, be in danger of sinking by its own weight: every story, moreover, should have a strength proportionate to the weight it is intended to sustain, and consequently pillars, pilasters, columns, or consoles, should be employed according to the strength that is required: the contrary practice is highly absurd in architecture, though very frequent in modern building. For the same reason each column should be thicker, and have a look of greater strength near the base, than the capital.

VIII. If we add to these precautions, that the architect should take care to give a due degree of strength to his walls, and to separate the stories either by arches or substantial beams, and not to place those beams too far asunder, and that he should have a good regard to the construction of the chimneys, and the roof of his building, we think we have said all that concerns the solidity of architecture in general.

IX. But all that utility and necessity rendered indispensable in this first simple and natural method of building, has been turned, in the course of time, into ornament. The wants of mankind have augmented, and luxury has increased with their wants:

from whence it follows, that more convenience, and more pleasing ornaments must naturally be required in a building. Stone, marble, costly wood, and bronze, the art of the sculptor, the founder, the painter, and gilder, have been employed in decorating the necessary parts of a building, and especially those which are most exposed to view; grace and elegance have likewise been sought after in its several proportions; and to the arrangement and symmetry of all these objects, has been given the name of *order*. Of this order, divers systems, or determinate manners in the construction of an edifice, have been invented; the proportions of the different parts of each order have been fixed, and reduced to a regular calculation; and to the orders themselves have been assigned different denominations; so that by an *order in architecture*, is now understood a regular column with its correspondent cornice.

X. Each order has three parts, 1, the *base*, or pedestal, which serves to sustain and to raise it from the ground; 2, the *shaft*, or shaft of the column; 3, the *entablature*, which crowns this grand piece of architecture, and represents, by an ornamentative projection, that which the column sustains. As the pedestal serves only to elevate the column, it may be omitted where that is of itself sufficiently raised, and its place may be supplied by a simple base, which may serve as a foundation. The entablature, on the contrary, is indispensable, for there can be no occasion for a column where there is nothing to be supported.

XI. Before we proceed to the explanation of the different orders of architecture, we shall just enumerate the several sorts of columns, or pillars, that have been invented for the decoration of edifices; referring those who are desirous of a more particular acquaintance with these matters, to the study of express treatises and dictionaries of architecture, where they will find them explained in full detail. Besides the columns of the five orders, of which we shall presently speak, there are,

1. Gothic

1. Gothic columns, which are such as we see in those buildings that still remain of that people.

2. Fluted columns, or such as have their shafts ornamented with channels or flutes.

3. Wreathed columns, whose shafts are twisted in the form of a spiral.

4. Florean columns, the fusts of which are ornamented with leaves, or flowers, that run round them in a spiral line.

5. Rustic columns, whose shafts are decorated with shells, petrifications, &c.

6. Diaphanous, or transparent columns.

7. Caryatid columns, which are those that are made in the form of women.

8. Persian columns, or such as are in the form of men.

9. Insulated columns, which are those that are unconnected with any edifice, such as Trajan's column at Rome, &c. These insulated columns bear different names, according to their different forms and uses, as,

a. Triumphal columns.

b. Funeral, or sepulchral columns.

c. Historic columns.

d. Heraldic, or blazoned columns.

e. Astronomic, or gnomonic columns.

f. Itinerary columns.

g. Colossean columns.

h. Pyramidal columns.

i. Obelisks.

10. Grouped columns, which are large Gothic pillars, surrounded by several small ones, that are insulated, and which receive the returns of the arches.

11. Diminished columns are such as are very slender for their height, or those that are in the extreme proportion, or, more properly, out of proportion.

XII. Let us return to the *orders* themselves. This name relates not only to the different columns and their proportions, but also to the pilasters and all other ornaments with which grand buildings are de-

corated. Every nation of the earth, all the most celebrated architects, as well ancient as modern, have attempted the invention of a new order of architecture, or an improvement of those that were already known; but to this day have never been able to discover any one more solid and useful, or of a more pleasing form, than is to be found in those five orders which have been transmitted to us by antiquity. These orders are called, 1. the *Tuscan*, 2. the *Doric*, 3. the *Ionic*, 4. the *Corinthian*, and, 5. the *Composite*. The Tuscan and Composite are Roman, the three others are Grecian, and represent the three different manners of building: the Doric, the solid; the Corinthian, the beautiful; and the Ionic, the intermediate manner. The two Italian are imperfect productions from the other three orders. In the Tuscan order, the column has seven modules; in the Doric, eight; in the Ionic, nine; and in the Corinthian and Composite, ten. A module is an arbitrary measure, that is used in regulating the proportions of a column, or other dimensions of a building. Some architects make it the lowest diameter of a column, and others only half that diameter; by which means the term becomes equivocal: it is subdivided into minutes.

XIII. Besides these five principal orders, there is also, 1. a French order, which Philibert de Lorme and M. Le Clerc would have added to the others; but it is a very bad one, and has not succeeded, no one having ever copied after it. 2. A Gothic order, which is so different from the proportions and ornaments of the antique, that its columns are like poles, with capitals of an enormous size. We should observe, however, that the Goths originally dwelt in a country, where the climate, rough and cold, would scarce admit the use of the Grecian architecture. We have, indeed, in our days, and in our northern climates, palaces in the Grecian, Vitruvian, and Palladian taste; and it must be confessed, that we freeze after a Grecian and Palladian manner, which to be sure is a blessing. 3. An Attic order, which has nothing

thing in it good but the name: it consists of a small order of pilasters of the lowest proportion, with a cornice in form of an architrave for its entablature. And, 4. A rustic order, which is ornamented with bossages, and, contrary to the last, has great merit.

XIV. Every column in each order is composed of three parts, which are the pedestal, the shaft, and the entablature (see section X), and each of these is again divided into three others. The pedestal is composed of, 1. the zocle, or plinth; 2. the die; 3. the cornice, or cymatium of the base. The shaft is composed of, 1. the plinth; 2. the shaft of the column itself; 3. the capital. The entablature consists of, 1. the architrave; 2. the frieze; 3. the cornice.

XV. To give more grace and elegance to these orders of architecture, they have been made to consist of small parts that are called *members*; but as they admit of such only as can be drawn by rule or compass, all these members are either flat or curved. Now as each order has its particular members and ornaments, which are very different, and have particular names that it is quite necessary to know, we must here specify the members and ornaments which enter into the composition of each order. The rest must be learned with the aid of figures and designs from the study of architecture itself.

XVI. The Tuscan order, which is the most simple in its parts, and the least ornamented of all others, received its origin from Tuscany. It is composed of the following members:

1. The pedestal, or zocle.
2. The plinth, reglet, or fillet of the base.
3. The tore, or baton.
4. The conge, or cincture, with the reglet, or fillet of the lower part of the column.
5. The fust or shaft of the column, which diminishes as it ascends.
6. The upper conge, with its list or fillet.
7. The astragal.

8. The

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8. The frieze of the capital, or the gorgerin or colarin.

9. The ovolo, or echinus.

10. The abacus, cymatium, or fallion.

11. The architrave.

12. The frieze.

13. The list of the gula.

14. The gula, or talon.

15. The crown, or larmier.

16. The upper ovolo, or echinus.

XVII. The Doric order was invented by the Dorians, a people of Greece. It is composed of the following members :

1. The zocle, plinth, or base of the pedestal.

2. The die of the pedestal.

3. The cornice, or cymatium of the pedestal.

4. The plinth, or zocle of the Attic base.

5. The inferior tore, or baton.

6. The scotia with its two listels.

7. The superior tore.

8. The conge or cincture.

9. The fust or shaft, with its flutes or channels.

10. The superior conge or cincture.

11. The astragal, or colarin.

12. The gorge or gula.

13. The annulets, or fillets.

14. The ovolo, or echinus.

15. The abacus, or cymatium.

16. The reglet of the abacus.

17. The second fascia of the architrave.

18. The first fascia of the architrave.

19. The guttæ, or drops which are under the triglyph.

20. The cymatium, or bandelette.

21. The triglyph.

22. The metops, which are sometimes filled with a bull's head.

23. The demi-metops.

24. The capital of the triglyph.

25. The cavet, or cymatium.

26. The ovolo.

27. The

- 27. The crown, or larmier.
- 28. The dentils, or teeth.
- 29. The head of a lion or dragon, &c. which serves as a spout for water, and is placed in the cornice on the right of the column.

- 30. The inverted gula.
- 31. The right gula, or ogee.

XVIII. The Ionic order takes its name from Ionia, a province in Asia. It is composed of these members.

- 1. The zocle of the pedestal.
- 2. The base of the pedestal.
- 3. The die of the pedestal.
- 4. The cornice, or cymatium of the pedestal.
- 5. The plinth, or fillet of the base of the column.
- 6. The second scotia.
- 7. The astragals, or annulets.
- 8. The first scotia.
- 9. The tore, or baton.
- 10. The cincture, or reglet.
- 11. The shaft of the column, with its flutes.
- 12. The list of the flutes.
- 13. The ovolo, or echinus, with the astragal above the ovolo.
- 14. The canal, or hollow above the volutes.
- 15. The volutes.
- 16. The eye of the volutes.
- 17. The line called catheta.
- 18. The abacus.
- 19. The first, second, and third fascia of the architrave.
- 20. The reglet of the architrave.
- 21. The frieze.
- 22. The scotia.
- 23. The ovolo.
- 24. The modillions.
- 25. The list of the modillions.
- 26. The crown, or larmier.
- 27. The cymatium, or inverted gula.
- 28. The principal cymatium, or right gula.

XIX. The

XIX. The Corinthian order was invented by Callimachus, an Athenian sculptor in the city of Corinth in Greece. This is the most perfect of all the orders, and the chef-d'œuvre of architecture. It observes the same proportions as the Ionic; and the principal difference there is between them is their capitals. This order is composed of the following members:

1. The socle of the base of the pedestal.
2. The base of the pedestal.
3. The die of the pedestal.
4. The cornice of the pedestal.
5. The plinth, or fillet of the base of the column.
6. The inferior tore, or baton.
7. The scotia, or cymatium, with two astragals above it.
8. The superior tore, or baton.
9. The astragal, with its cincture, or reglet, above it.
10. The fust of the column.
11. The astragal.
12. The leaves.
13. The caulicoles.
14. The body of the capital.
15. The abacus.
16. The rose, or flower of the capital.
17. The fascia of the architrave.
18. The frieze.
19. The dentils.
20. The rose cases between each modillion.
21. The modillions.

XX. The Composite order was added to the others by the Romans, after Augustus had restored peace to the world. It resembles the Ionic and Corinthian, but has still more ornament than the latter. It is composed of the following members.

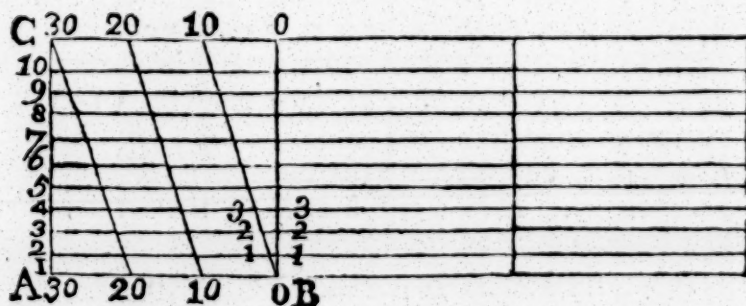
1. The pedestal, which is Corinthian.
2. The fust, which is also Corinthian.
3. The capital, ornamented with leaves.
4. The ovolo, with the astragal under it.
5. The volutes.

6. The

6. The abacus.
7. The architrave.
8. The frieze.
9. The cornice.

This column, in all its other members and dimensions, is the same as the Corinthian, except that its capital has only four volutes, which take up all the space that in the Corinthian is filled by the volutes and caulicoles. It has, besides, the ovolo and astragal, which are proper to the Ionic order.

XXI. These five orders have each of them its peculiar, certain dimensions for all its separate members. The calculation of these given dimensions appertains to the mathematics, and is in this respect so determinate, that when the base of a column is given, the height and diameter of all its other parts are immediately known. This calculation would carry us beyond our bounds; but we must not omit here to explain, in a few words, the manner of determining these proportionate measures, by means of a scale. They assume the dimension or measure of a rectangular module at pleasure, and then divide it into three equal parts.



The line AC is drawn perpendicular to AB, and is divided into ten equal parts; and from each of these divisions, in the line AC, are drawn lines parallel to AB; lastly, lines are drawn from the points, 30 to 20, from 20 to 10, and from 10 to 0, which produce $1. 1 = \frac{1}{30}$. $2. 2 = \frac{2}{30}$. $3. 3 = \frac{3}{30}$. &c. This scale

scale is the foundation of all the dimensions of any column or regular building whatever ; and this is the principle on which architects proceed. They have, beside, another scale of reduction, by which they reduce the dimensions of a design.

XXII. As proportion concurs greatly to the elegance and beauty of a building, and as, independent of those which are given for the five orders above-mentioned, the architect has frequently occasion to make use of such as are arbitrary, we think we should here add some short reflections on proportion in general. Proportion consists in such relations between two objects as are just and agreeable. The ancient architects have derived these relations, in their works, sometimes from those of the human body, and at others from those of music ; but it does not appear, that these objects have any properties in common with an edifice, from whence a rational relation can be deduced. The relations or proportions that arise from extension are most pleasing, when the eye can easily discover them, and the mind can distinguish them without labour ; when they can be determined without the use of numbers that are very great, or divisions that are very minute, as for example, $1 : 1$, $1 : 2$, $1 : 3$, $1 : 4$, $1 : 5$, $1 : 6$, &c. or $2 : 3$, $3 : 4$, $4 : 5$, $5 : 6$, &c. or $3 : 5$, $5 : 7$, $7 : 9$, &c. The rest of these proportions consist principally in the eye, the judgment, and the taste of the architect, who ought always to remember the use for which each building is designed, and regulate the dimensions of every part accordingly. It is in this branch of the art that Palladio excels.

XXIII. As a building ought not only to be durable, convenient, and beautiful, but as its mere aspect ought to determine its destination, the architect should take great care to give it a just character, or, so to say, a proper physiognomy. A royal palace that has the exterior appearance of an hospital, an alms-house loaded with ornaments, a church that resembles a green-house, or an orangery in the form of a chapel, are to be regarded as monstrous productions

tions in architecture, and are certain proofs of a vicious taste. The destination of an edifice ought to determine its natural character, and its natural character the choice of the order that should be made use of, as well as of all its various ornaments.

XXIV. This precept, founded in sound reason, leads us to speak of the different buildings in which architecture is employed. They are of three kinds, 1. sacred edifices; 2. public edifices; and, 3. buildings for private habitations.

Sacred edifices comprehend, 1. churches, temples, mosques, synagogues, basilics, rotunds, &c. among all which, there is no one more difficult to ornament than the churches of the reformed religion, which admit of no images, nor any superb and glaring decorations; the towers or steeples of churches, which perhaps are the most difficult works of architecture, and in which the chief excellence seems to consist in properly reducing them, that is, in giving them their pyramidal figure, which diminishes insensibly, and with elegance, towards the summit; 3. altars; 4. chapels; 5. tombs or monuments; 6. porticos, &c.

Public edifices comprehend, 1. palaces for kings and other sovereigns; 2. castles, or other buildings for their diversion; 3. town or Stadt-houses; 4. arsenals; 5. public libraries; 6. theatres, and buildings for public assemblies; 7. burses, or exchanges for the meeting of merchants; 8. places for public exercises; 9. public schools in universities; 10. prisons; 11. city gates; 12. triumphal arches; 13. columns and obelisks; 14. arcades, under which tradesmen fix their shops; 15. aquaducts; 16. public fountains and reservoirs; 17. bridges; 18. public invalids, founding hospitals, &c. 19. public colleges, with their dependencies; 20. barracks; 21. ecuries; 22. sluices; 23. keys, magazines, granaries, &c.

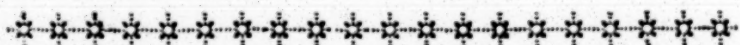
Private buildings include, 1. the palaces of princes; 2. the houses of noblemen; 3. the dwellings of private persons; 4. houses for country diversions;

fions ; 5. pavilions ; 6. grottos ; 7. saloons ; 8. orangeries ; 9. green houses ; 10. ice-houses ; and every other kind of building that persons in private stations construct for their convenience, their amusement, or their luxury.

XXV. Each of these buildings ought to express, as we have already said, by its external figure, for what purpose it is intended ; and it is in this expression that the genius of architecture is best displayed. With regard to the other parts of building, we naturally pass them over, as they more properly belong to the mechanical knowledge of a builder than to the study of architecture.

XXVI. Every country being situate under a different climate, and each nation having its peculiar customs and manner of living, the architect should give due attention, in the plan of his building, to that climate, and to the customs of that country in which he is to build ; for it would be ridiculous to erect, in the most northern countries of Europe, edifices of the same form with those of Sicily, or the island of Malta. In France, where convenience in building is much sought after, they may properly introduce alcoves, small closets, niches, and numberless such like accommodations, which in Italy would become the nests of insects, vipers, and other venomous animals. The architect should likewise have regard to the birth, condition, rank, or employment of him for whom he builds. There are in Germany palaces for sovereigns that are of an immense extent, very solidly built, and the exterior parts highly decorated, but where the insides are very badly disposed, where there is no capital room for assemblies or audience, no gallery, no drawing-room, &c. which are egregious absurdities. The offices and departments for domestics are also articles of great importance in the disposition of the interior parts of a palace, or other grand building ; and under this head are to be included the ecuries, and other necessary dependencies.

XXVII. It is, moreover, in general, a great defect in architecture, when a due proportion is not observed in the several parts of a building; when, for example, the halls are small, and the closets large; when spacious windows are placed in the meanest apartments, as in the rooms for domestics, &c. Lastly, the genius of the architect should more especially appear in the choice of proper ornaments for each edifice, for those of a church, a theatre, or an ecury, ought by no means to be similar.



C H A P. XIII.

DECLAMATION.

INDEPENDENT of the articulation of syllables and words, man expresses his thoughts, his desires, his passions, in a word, the emotions of his mind, by the different tones and degrees of his voice, by his eyes, by the muscles of his face, by the attitudes of his body, and by the actions of his hands and feet. Now this kind of expression, by which the body shews what the mind feels, is called, when taken in its full extent, *declamation*. It sometimes accompanies a discourse, and serves to give it greater strength and elegance; and sometimes it is expressed without the aid of the voice, and attended with instrumental music only, as in the dance and pantomime. It is of the former kind of declamation that we propose to treat here, leaving the other till we shall come to the article of dancing, in the Digression on Exercises.

II. We here understand, therefore, by the term declamation, *the art of pronouncing a discourse in public, with proper expressions of the countenance, and actions of the body*. According to the manners and customs

customs of the present age, public harangues are made only,

1. In the pulpit.
2. In the senate, at council, in a congress, &c.
3. In some illustrious assembly, as at a nuptial or funeral ceremony, &c.
4. By public professors.
5. On the theatre.

III. With regard to the declamation of the pulpit, the dignity and sanctity of the place, and the importance of the subject, require the preacher to exert the utmost powers of his voice to produce a pronunciation that is perfectly distinct and harmonious, and that he observe a deportment and action which is expressive and graceful. No man, therefore, who is destitute of a voice, should ascend the pulpit, and there act the part of a pantomime before his audience. The preacher should not, however, roar like a common crier, and rend the ear with the voice of thunder; for such kind of declamation is not only without meaning, and without persuasion, but highly incongruous with the meek and gentle expressions of the Gospel. He should likewise take particular care to avoid a monotony; his voice should rise from the beginning, as it were by degrees, and its greatest strength should be exerted in the application. Each inflexion of the voice should be adapted to the phrase, and to the meaning of the words; and each remarkable expression should have its peculiar inflexion. The dogmatic requires a plain, uniform tone of voice only; and the menaces of the Gospel demand a greater force than do its promises and rewards: but the latter should not be pronounced in the soft tone of a flute, nor the former with the loud sound of a trumpet. The voice should still retain its natural tone in all its various inflexions. Happy is that preacher to whom nature has given a voice that is at once strong, flexible, and harmonious.

IV. An air of complacency and benevolence, as well as devotion, should be constantly visible in the countenance

countenance of the preacher. But every appearance of affectation must be carefully avoided: for nothing is so disgusting to an audience as even the semblance of dissimulation. Eyes constantly rolling, turned towards heaven, and streaming with tears, rather denote a hypocrite, than a man possessed of the real spirit of religion, and that feels the true import of what he preaches. An air of affected devotion infallibly destroys the efficacy of all that the preacher can say, however just and important it may be. On the other hand, he must avoid every appearance of mirth or raillery, or of that cold, unfeeling manner, which is so natural to freeze the hearts of his hearers.

V. The body should be in general erect, and in a natural and easy attitude. The perpetual movement, or contortion of the body, has a ridiculous effect in the pulpit, and makes the figure of a preacher and a harlequin much too similar; but, on the other hand, he ought not to remain constantly upright and motionless, like a speaking statue.

VI. The motions of the hands give a strong expression to a discourse; but they should be constantly decent, grave, noble, and expressive. The preacher, who is incessantly in action, who is perpetually clasping his hands, or who menaces with a clenched fist, or counts his arguments on his fingers, will excite mirth only among his auditory. In a word, declamation is an art that the sacred orator should study with the utmost assiduity. The design of a sermon is to convince, to affect, and to persuade. The voice, the countenance, and the action, which are to produce this triple effect, are therefore the objects to which the preacher should particularly apply himself.

VII. The declamation of a minister or statesman in the senate, in council, or other public assembly, is of a more unconfined nature. To persuade, to move the passions, and gain an ascendancy in a public assembly, the orator should himself feel the force of what he says, and the declamation should only express that
internal

internal sensation. But nothing should be carried to excess. A suavity in the tone of voice, a dignity of deportment, a graceful action, and a certain tranquillity of countenance, should constantly accompany the statesman when he speaks in public, even when he is most earnestly engaged in debate, or when he is addressing his sovereign in person. A pleasing tone of voice, and a distinct pronunciation, prejudice the hearers greatly in the speaker's favour. A young man may improve these to a surprising degree. Demosthenes, who had a natural impediment in his speech, was accustomed to go to the sea-shore, and partly filling his mouth with pebbles, he declaimed with a loud voice. The stones by degrees gave a volubility to his tongue, and the roaring of the waves reconciled him insensibly to the noise of the multitude.

VIII. The same rules are to be observed by those who are appointed to harangue at public and illustrious ceremonies, whether congratulatory or funeral. On the latter occasion, the orator is to express, moreover, a concern, a commiseration, a grief, that frequently he does not feel. He should take great care, however, that there be no appearance of hypocrisy, affectation, or extravagance in his discourse: and yet even this would be more tolerable than a trifling, insensible manner, or an ill-timed wit, which, on this occasion, is of all things the most disagreeable.

IX. The principal object of a public professor is the instruction of the studious youth: for which purpose he is to convince and persuade. Every tone of voice, every expression of the countenance, or action of the body, which can produce this effect by enforcing the words, should therefore be employed by those who are to teach the sciences. There is, moreover, one very essential reflection, which every professor ought to make, and which is, that the chair, from which he harangues, is surrounded by young students, naturally possessed with vivacity, not infrequently

quently ludicrous, and for the most part previously instructed in the preparatory sciences. They are, therefore, constantly inclined to criticise, to jest, and to ridicule: for which reason, the professor should endeavour to inspire them with respect and attention, by a grave, commanding, and venerable countenance; and carefully avoid all appearance of grimace in his action, and every kind of affectation in his discourse, that he may not afford the least opportunity for pleasantry.

X. We are now come to *theatric declamation*. This was very different among the ancients from what it is, and ought to be with us, from the nature of the thing itself, and from the difference of circumstances. Numberless passages in Quintilian, and other ancient historians, critics, grammarians, and commentators, evidently prove, that the ancient dramatic declamation was subservient to the rules of the musical rhythm; and by this, according to Aristides *, their action, as well as recital, was regulated. But to explain this seeming paradox, it will be necessary to make here some preliminary remarks. The ancients gave a much more extensive signification than we do to the word music (*musica*) which they derived from the muses, or at least from some of them. It is for this reason that the same Aristides and Quintilian define it to be an art that teaches all that relates to the use of the voice, and the manner of performing all the motions of the body with grace: *ars decoris in vocibus & motibus*. Therefore, poetry, declamation, dancing, pantomimes, and many other gestures and exercises, were subservient to this art.

XI. That part of general music, which taught the art of declamation and gesture, according to the rules of an established method (and which we perform by instinct, or, at most, by the aid of common sense) was distinguished by the name of *hypocritic music*; and this musical art was called by the Greeks *orchesis*,

* De Musica, lib. i.

and by the Romans *saltatio*. It was, however, so far from being an advantage to the ancients to have had this art, which we have not, that it was, on the contrary, a mark of great imperfection. For, in the first place, it was an instance of high absurdity to represent a tragedy or comedy before an audience of twenty thousand people, the far greatest part of whom could neither hear nor see what passed to any good purpose, unless they were possessed of organs that we have not. The theatres of Paris and London may conveniently contain about a thousand persons, and that is found sufficient in the most populous cities, where there are several places of entertainment on the same day, and where the people are reasonable enough to succeed each other in their diversions. As the features of the face could not be distinguished at so great a distance, and still less the alteration of countenance, in order to represent the different passions, they were obliged to have recourse to *masks*; a wretched, childish invention, that destroyed all the strength and variety of expression. Their action became extravagant, and, at the same time, subservient to a regular mechanism, which prevented all the refinement, and all the pleasure of surprise, in the performance, and must have had an effect horribly disagreeable to those who were placed near the stage.

XII. The egregious imperfection of their language likewise, which consisted of syllables long and short, whose duration was determined by a set measure of time, and their manner of tuning these syllables, after the method of the orchesis of the Greeks, was another disadvantage. For by this mean they determined by notes, or characters placed after the long and short syllables, not only the nature, but the duration of each action. Now, nothing could be more affected, more constrained and disgusting, than such method of declaiming. How far superior in this respect are the moderns, who consult nature alone in their theatric declamation, who can make the audience hear each sigh; who can accompany it with a proper

proper attitude ; who can incessantly vary their action ; who can seize the lucky moment, and make the countenance fully express the sensations of the mind ? Nature does all here ; and art, infinitely inferior to nature, did all among the ancients. Modern declamation cannot be subservient to a musical rhythmus, seeing we speak rapidly, and without affectation. Our actors learn their art without art, from nature itself, assisted by reflection ; and they arrive at a degree of excellence infinitely greater than that of the ancients, by a method far more simple, and by efforts incomparably more easy.

XIII. We do not, moreover, precisely know what the theatric declamation of the ancients was, nor what were the musical instruments which accompanied that declamation. The title to the *Eunuch of Terence* says, for example, *that Flaccus, the freedman of Claudius, made the music of that piece, in which he employed the two flutes, the right and the left.* These flutes, it is likely, gave the tone to the actor ; which must have had a very odd effect on the audience. Most of the ancient pieces have similar titles. They who would be particularly informed of the art of declaiming among the Greeks and Romans, may read to advantage the *critical reflections on poetry and painting by the abbé du Bos.* The third part of that work consists entirely of learned researches, and ingenious reflections, on this silly practice of the ancients. But as this art has happily no place in modern declamation, and can, at best, serve only to make a parade of erudition, we shall say no more of it, but pass to matters of real utility.

XIV. We think there is good reason to believe, moreover, that the most polished nations of modern Europe do not accompany their discourses, in general, with so many gesticulations as did the Greeks, the Romans, and other inhabitants of the warm climates. They appear to have found the method of animating a discourse, and giving it an expression, by the simple inflexions of the voice, and by the features of the

countenance, which is far more decent, more just and rational, than all those contortions which perpetually derange the natural attitude of the body and its members, and give the speaker the air of a harlequin.

XV. *Expression*, therefore, forms at once the essence and the end of declamation; and the means of producing it consists in a pronunciation that is sonorous, distinct, and pleasing, supported by an action that is decent and proper to the subject. If the best dramatic poet has need of a good declaimer, or actor, to make his writing produce its proper effect, the actor has likewise need of a good poet to enable him to please and affect by his action: for it is to little purpose that he endeavours to charm his auditory, by uniting with nature all the powers of art, if the poet has not furnished him with sentiments that are rational and affecting. The French comedians have, in this respect, a great advantage over those of all other nations, by the perfection to which their poets have carried the French drama; although it now loses something of its fire and sublimity, by an injudicious scrupulosity in matters of decorum, by an excessive delicacy, which freezes every animated expression, and gives a lifeless appearance to all modern dramatic productions.

XVI. The actor, in studying his part before a large mirror, where he can see his whole figure, in order to determine the most proper expression for every thought, should consult nature, and endeavour to imitate her. But in this imitation he should take care not to make too servile a copy. He has this to observe, in common with his colleagues, the masters in all the polite arts. The theatre is intended to exhibit an imitation of nature, and not nature itself. Tragedy and comedy form pictures of human life, but these pictures are also pieces of perspective, which require strokes somewhat stronger than nature, that they may be discerned at a distance. The actor is elevated to a considerable height from the ground; he is surrounded

rounded by scenery, he is separated from the audience by the orchestra, and he speaks in verse: all this is not natural; but the spectator is to accede to this necessary illusion, in order to promote his own pleasure, which would not be so great as it is, were all these matters otherwise disposed. Declamation, therefore, should somewhat exceed, but never lose sight of nature.

XVII. The tone of the actor's voice should be natural, but regulated by the extent of the theatre; sufficiently loud to be heard by all the audience, but not so violent as to rend their ears. Of all theatric declamation that I have ever heard, that of the English, at first, shocked my ears the most; and though, after a considerable time, I became more accustomed to it, yet those excessive strainings of the voice, those tragic roarings, appeared to me very far from natural. A pure and graceful pronunciation, without any provincial accent, is likewise a great merit in an actor, and he should also habituate himself to speak in a manner perfectly distinct. It is a capital point in the pronouncing of verse, not to separate the two hemistichs, by resting too long on the cæsura in the middle, or dwelling on the end of each hemistich; for, by so doing, the actor falls into a monotony, an insufferable uniformity of cadence, in a piece that consists of some thousand verses. The gradations of the voice demand also a very judicious observance. The speaker, who begins in a high tone, will find it very difficult to sustain it through the whole piece; and he, who clamours incessantly, will find his lungs fail him in those parts where the vehemence of passion requires the strongest efforts. If we may be allowed the expression, the strongest touches, the boldest figures, will not there stand out from the picture in a striking manner.

XVIII. The deportment of an actor should be constantly graceful, decent, and proper to the character he represents. An old man has a different position of body from a young petit maitre, an aged

queen from a young princefs, a noble gallant from a valet de chambre. A rational obfervance of nature, and an imitation of the beft actors, are here the fureft guides. The fame may be faid of the action of the hands, the theatric ftep, &c. An inanimated figure, a body in the pofition of a ftatue, and hands immoveable, are as difpleafing in the fcene, as a player, whofe inceffant gesticulation refembles the action of a puppet.

XIX. Every actor, who afpires to make his art fomething more than merely mechanical, will begin by enabling himfelf readily to repeat his part, that the defect of his memory may not embarrafs his action. When he is fo far a mafter of it, he will make it the fubject of ferious reflection in his clofet, endeavour to feize the true fense of the author, and to find out that expreffion of each fentiment and paffion, which is the moft natural, the moft ftriking, and beft adapted to the ftage; and which he will cultivate, by repeated effays, till he is able to render it in its full force. Madam le Couvreur was ufed to mount to the apartment of abbé du Bos, who lived on the fourth ftory, in order to learn, from that intelligent old man, in what manner M. Racine taught Madam Chancelé to pronounce fuch or fuch a verfe or paffage.

XX. It is not the longeft fpeeches that are commonly the moft difficult to pronounce. A verfe, a fentence, or even a fingle word, frequently requires the utmoft attention and exercife. This line, which is fpoke by Nero in Britannicus,

Narciffe, c'en eft fait, Néron eft amoureux!

and thefe three words of Orafmine in Zaïre,

————— Zaïre! vous pleurez!

have given more embarraffment to Baron, Grandval, and Dufrefne, than the moft pompous fpeeches. They have repeated them before the glafs, perhaps twenty ways, before they have been able to catch the true manner.

manner. M. Racine directed the beginning of the third scene of his Phædra to be played in a manner quite different from what is now practised. He admitted of no declamation. Phædra entered, supported by her ladies, when, advancing slowly on the stage, and representing a woman loaded with griefs, and exhausted with infirmities, she says, in a natural and uniform tone of voice,

N'allons pas plus avant, demeurons chere Oenone ;
Je ne me soutiens plus, ma force m'abandonne.

This tender and faint tone continues till the beginning of the second couplet, where she says,

Que ces vains ornements, que ces voiles me pesent !

which she pronounces with some warmth ; reserving, however, her greatest force for those fiery and impetuous passages, which make the part of Phædra the boldest and most violent of any in the French drama. It requires great natural talents, much reflection, and repeated observation of the performance of others, to attain that high degree of excellence in theatric declamation which we have seen exhibited by such actors as Chancelé, le Couvreur, Clairon, Baron, Dufresne, and la Nouë *.

* Shall I be once more so happy (says our author) as to see, on the fortunate borders of the Seine, the able successors of these illustrious favourites of Melpomene and Thalia ? May I not one day here insert their names from a knowledge of their talents ? If ever my fortune shall again conduct me to Paris, these muses shall frequently see me at their temple.

END of the SECOND VOLUME.



